OOD MANUFACTURE

FOOD MANUFACTURE

BLISHERS: LEONARD HILL LIMITED, 17, STRATFORD PLACE, LONDON, W. 1 JANUARY, 19

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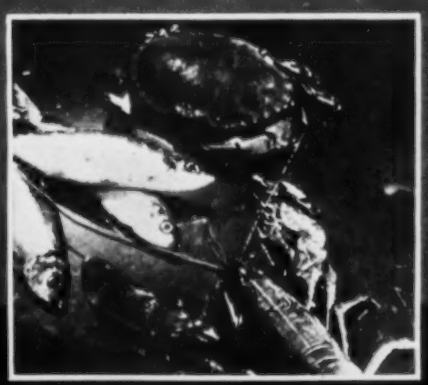

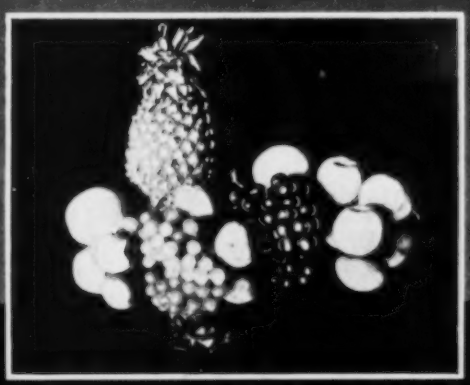

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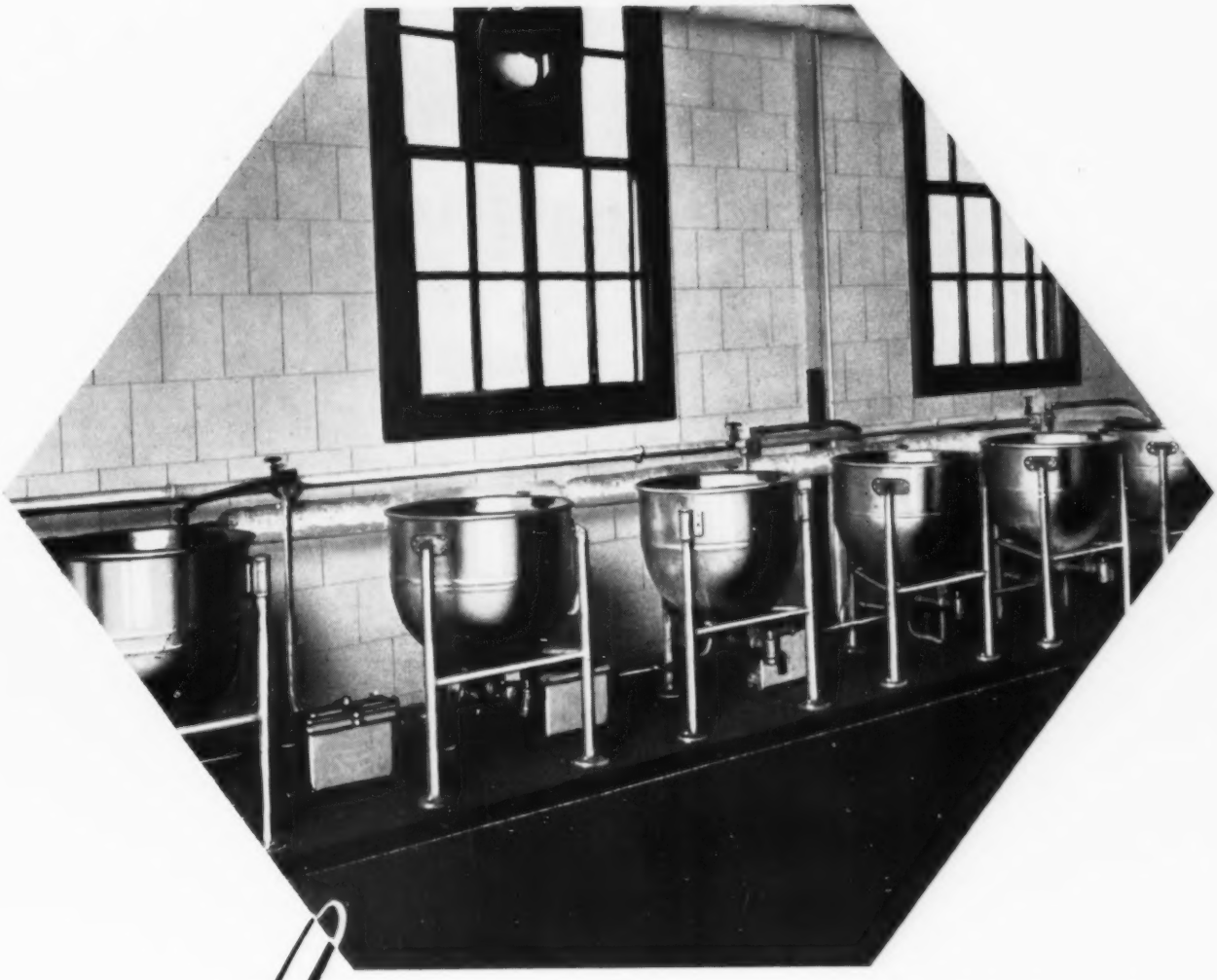

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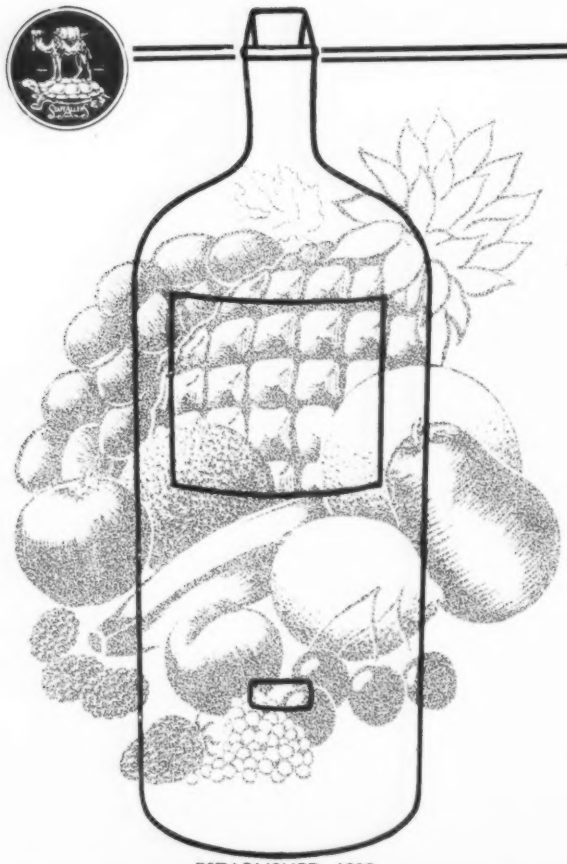

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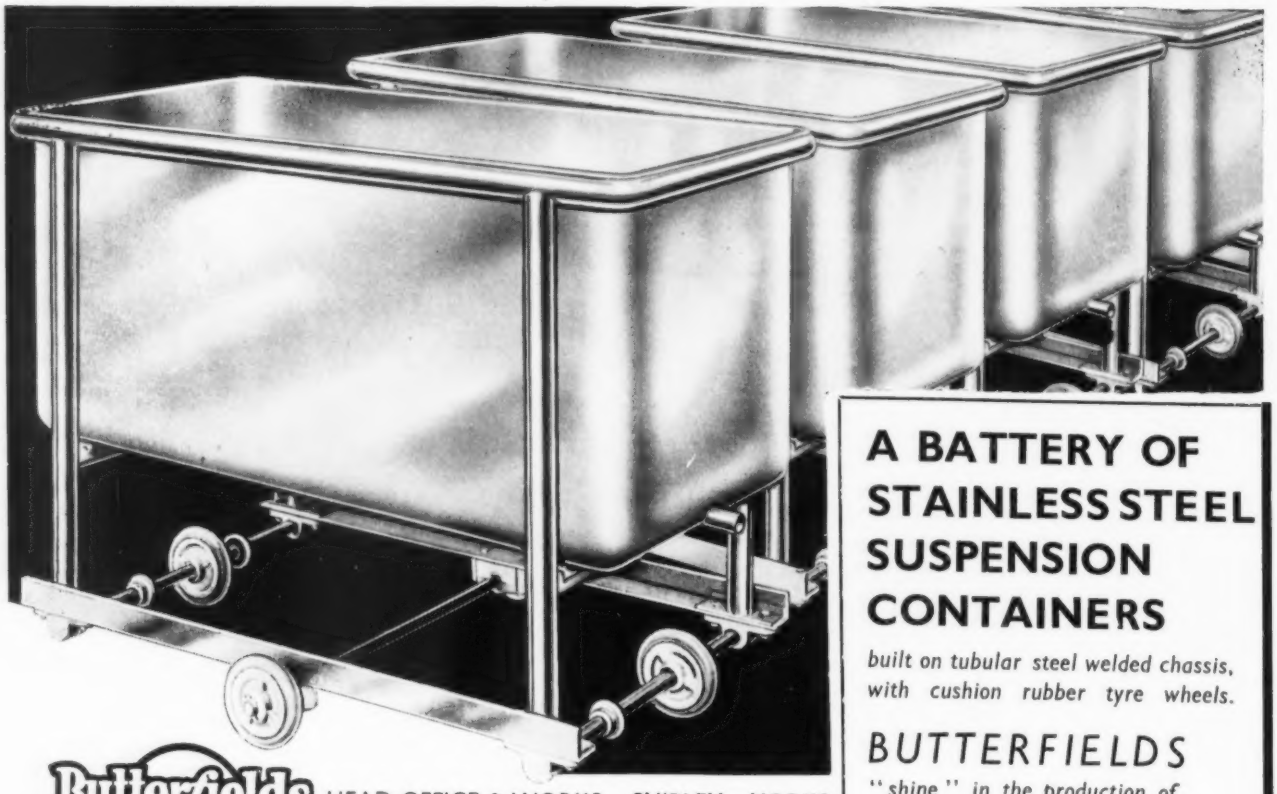

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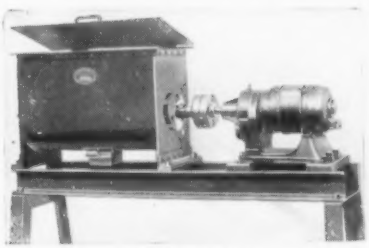

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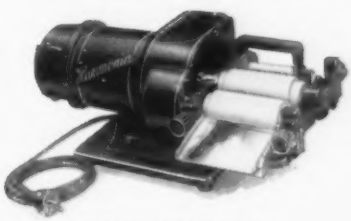

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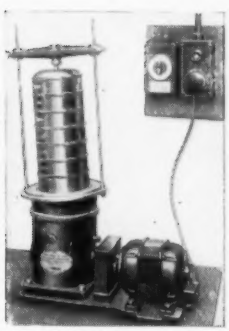

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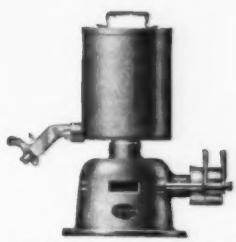

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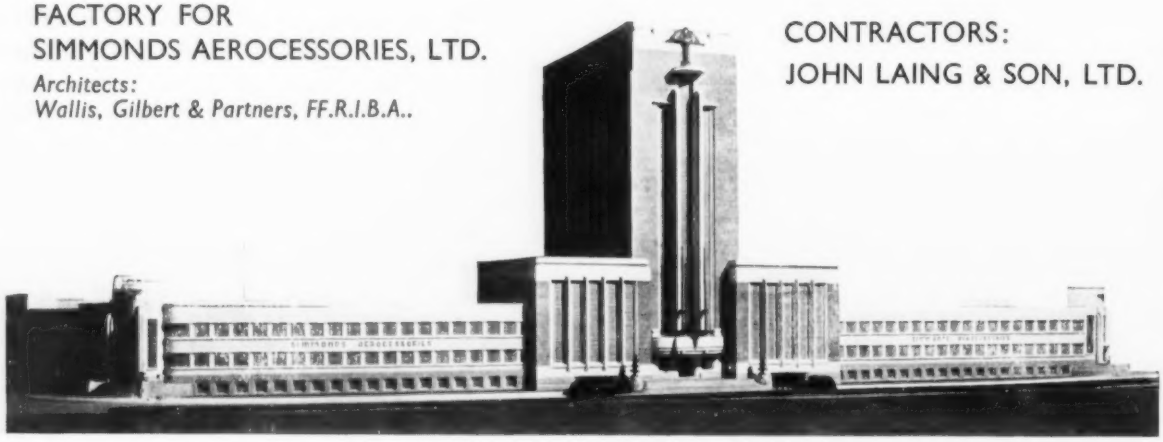

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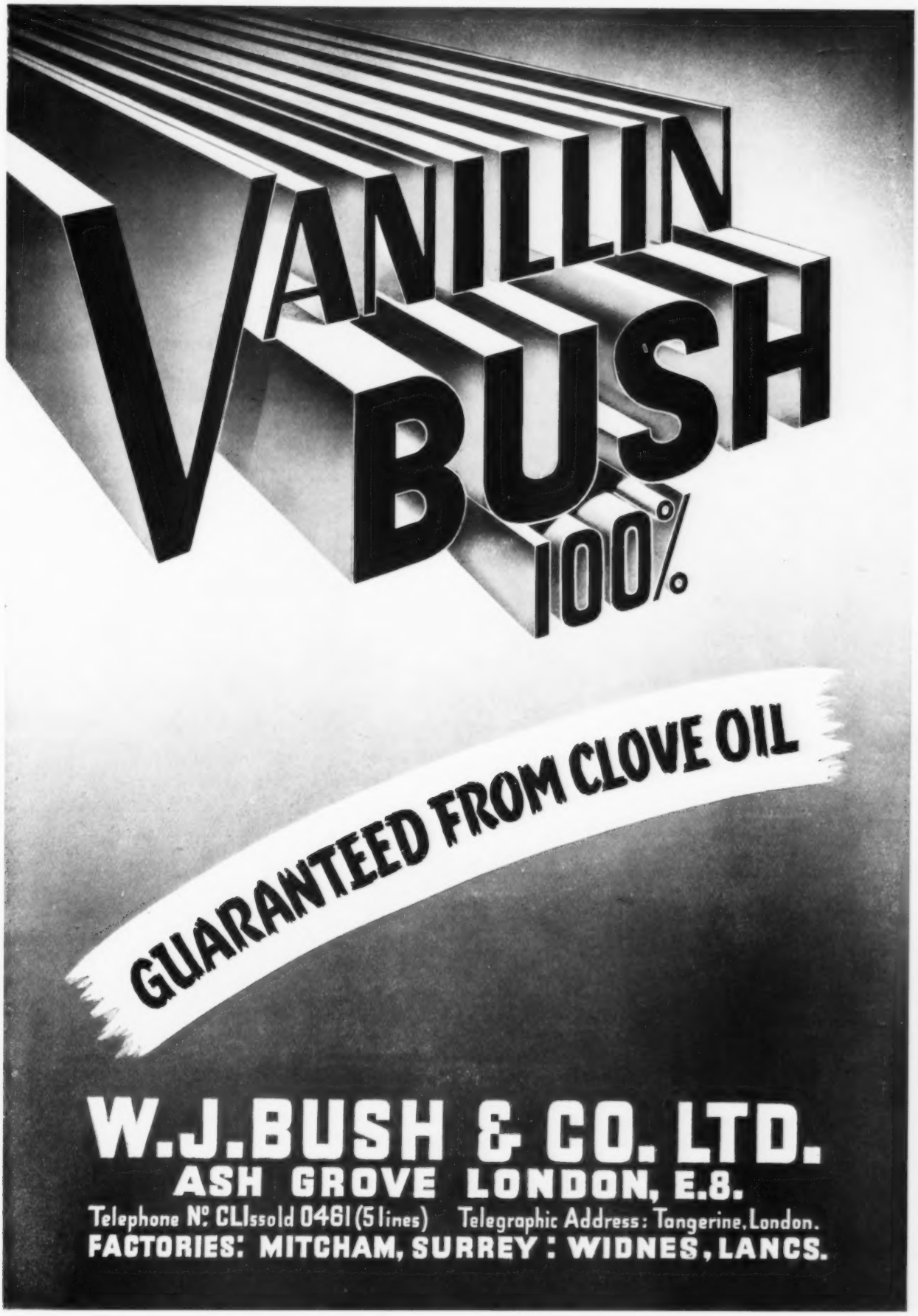
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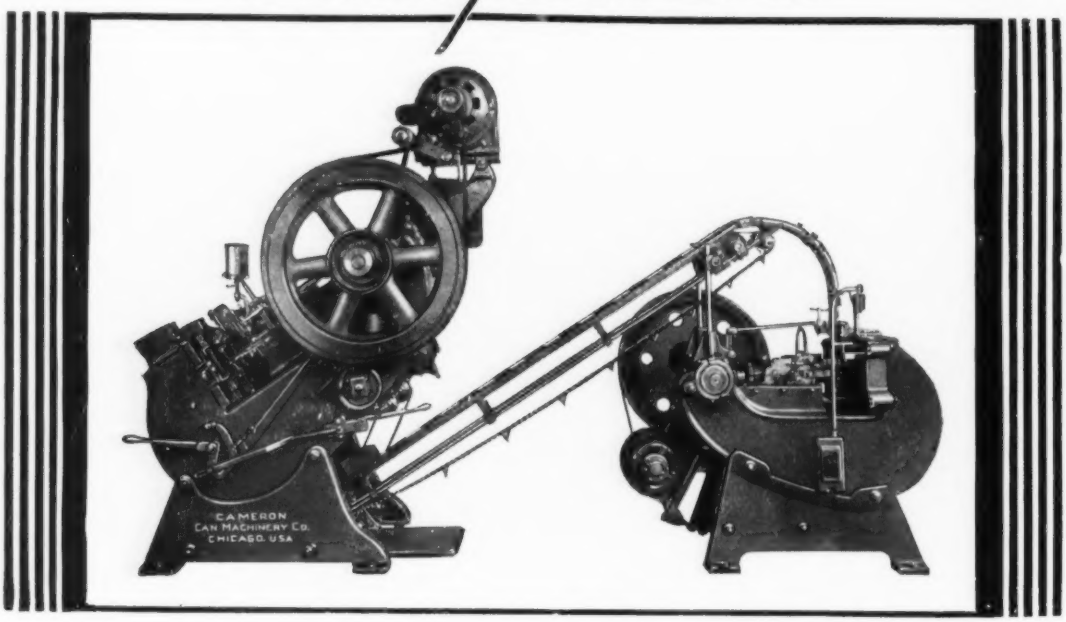

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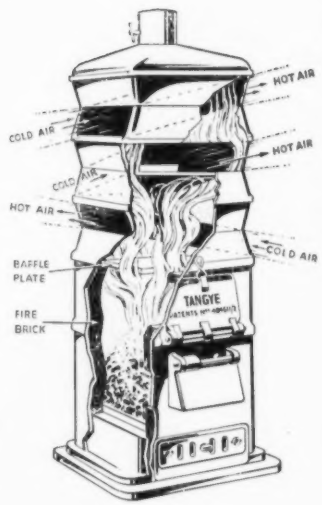

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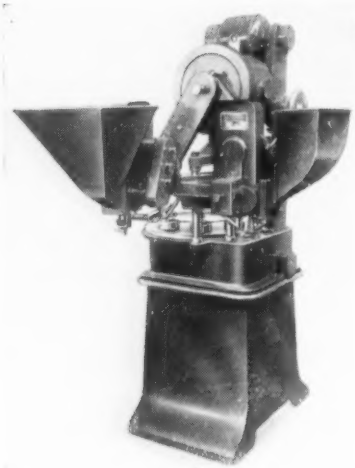

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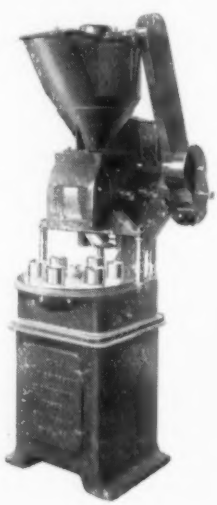

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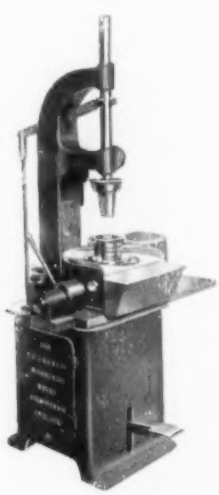

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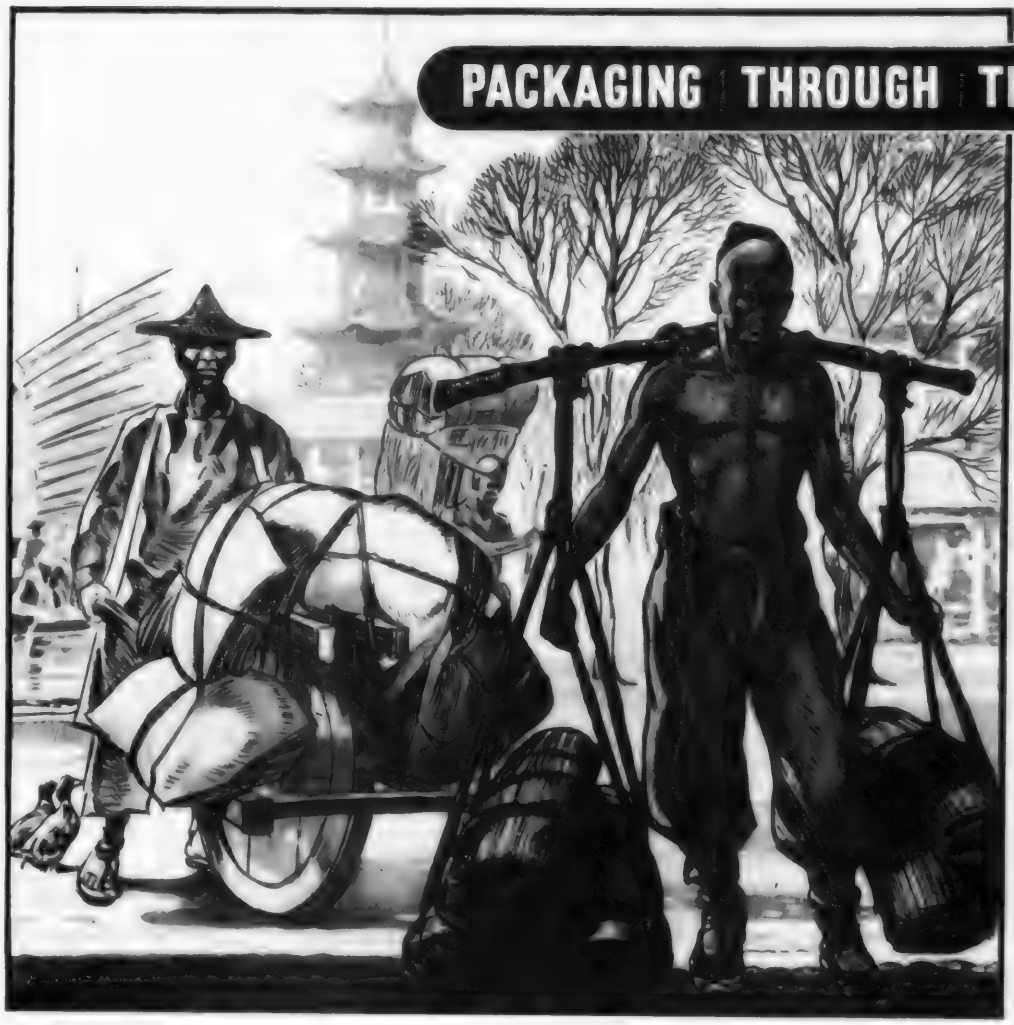

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"FOOD MANUFACTURE" is read by every food manufacturer of importance in the world. But not only is it read—it is universally regarded as the premier journal of the food industry, with an influence that is literally world wide. It has helped to supplant foreign food plant by that of British make, and has upheld and increased the reputation of home manufactures.

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U.S.A. . . . *We here find your publication most interesting and helpful, and particularly in the laboratory. In fact, our laboratory looks forward to the receipt of "FOOD MANUFACTURE" with more interest than they do to considerable of the trade publications published here in the States.*

AUSTRALIA . . . *We specialise in the technology of foodstuffs, and frequently have occasion to order plant on behalf of our clients. Most of the specialised equipment in food manufacture imported into Australia has been of American origin, and it is most refreshing and encouraging to observe what a wide range of British equipment is now available for the purpose.*

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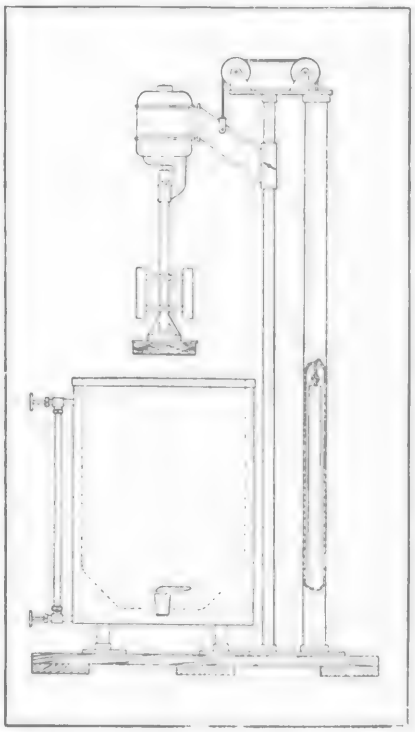

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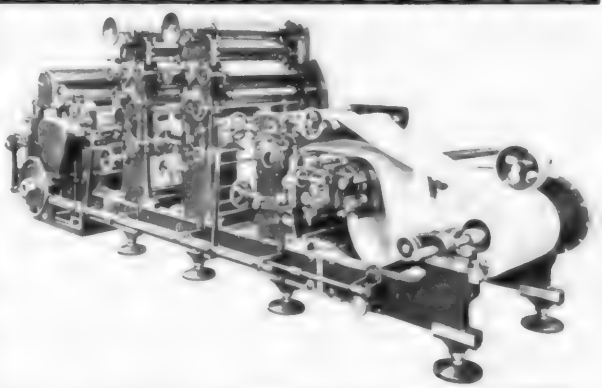

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Join the **"DRIFT NORTH"** *for more safety from* **AIR-RAID**

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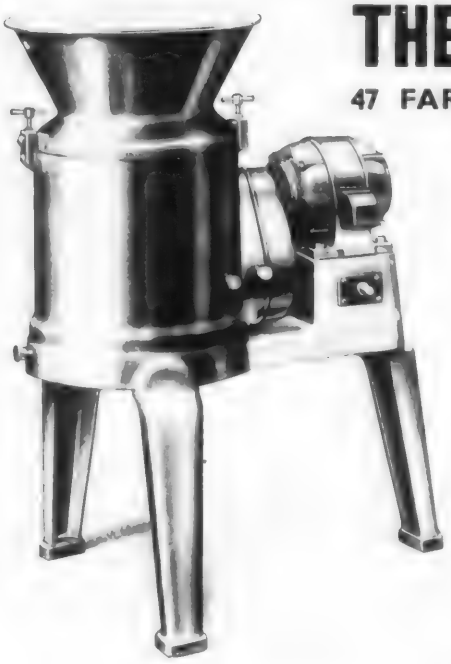

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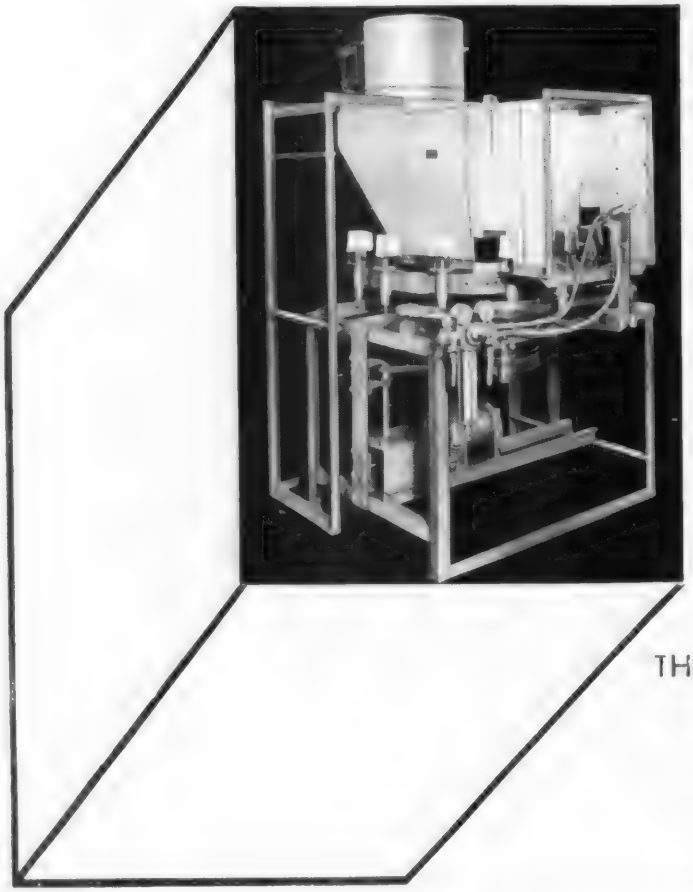

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Here's your opportunity to settle your packing problems once and for all. Aerograph Automatic Spraying Machines are made in a wide range of types and sizes for damping and for applying wax solutions and protective hygienic finishes to cartons and food containers. If you would care to discuss your own particular packing problems with one of our engineers, please let us know the time and place most convenient to you and we will gladly make arrangements accordingly. There is of course no obligation involved.

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Why do British Railways' Road-Rail Containers cut down the distribution costs on all kinds of goods from Bicycles to Biscuits, from Furniture to Fruit? Because Road-Rail Containers (which are in effect demountable bodies of Railway Trucks) can be packed at sender's own premises, thus ensuring substantial savings in packing costs and eliminating the "returned empties" problem. Why do British Railways' Road-Rail Containers provide safer and quicker door-to-door delivery? Because goods packed in Road-Rail Containers are not touched by hand between sender's premises and customer's door. There is a special type of Road-Rail Container for your class of goods, and if you are not yet making use of this better transport facility, please telephone your nearest Railway Station or Goods Office for full particulars.

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GLASS CONTAINERS OF EVERY DESCRIPTION

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PRODUCTS

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- Prompt Delivery and Service.
- We should be glad to make suggestions for new designs.
- Send us your enquiries.

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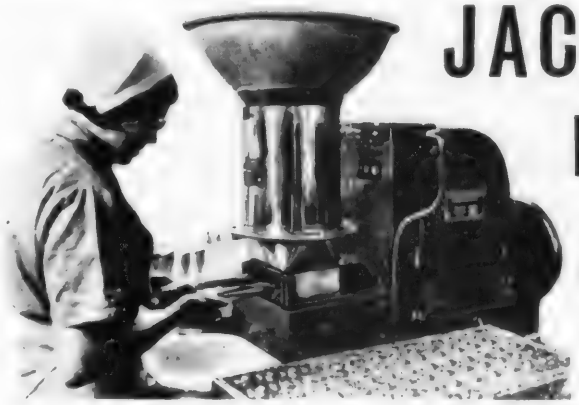

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40 JARS PER MINUTE
STAINLESS STEEL HOPPER

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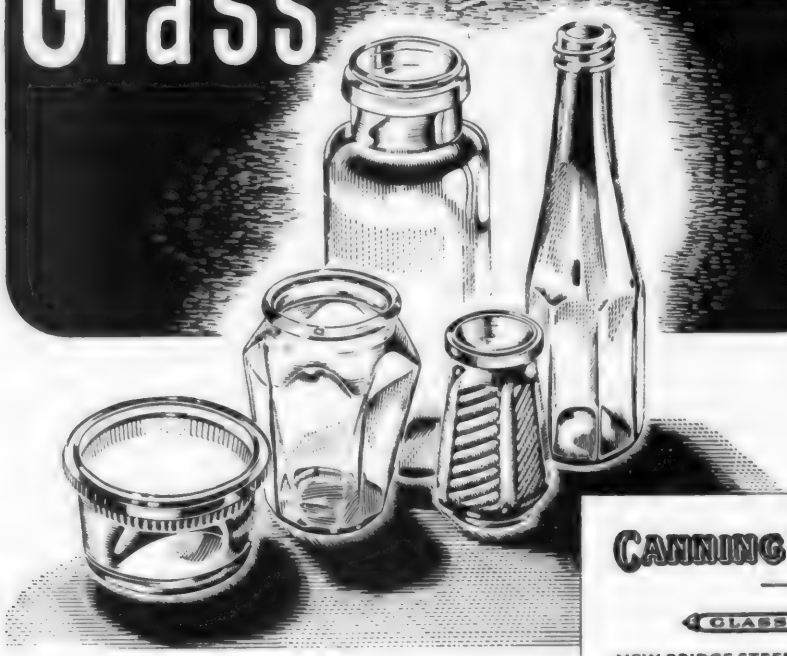

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TRADE _____ Individual making Enquiry _____

Nature of Enquiry:

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N.B.—Subscribers should enclose a stamped, addressed envelope for reply. Non-subscribers will be answered only in the journal, and should enclose a postal order for 1s. 9d. to cover registration fee and a copy of FOOD MANUFACTURE *containing the reply. The enquiry may be made either in the space provided above or in a separate letter, but in every case the above form must be completed, and sent to* **Food Manufacture**, *17, Stratford Place, London, W. 1, England.*

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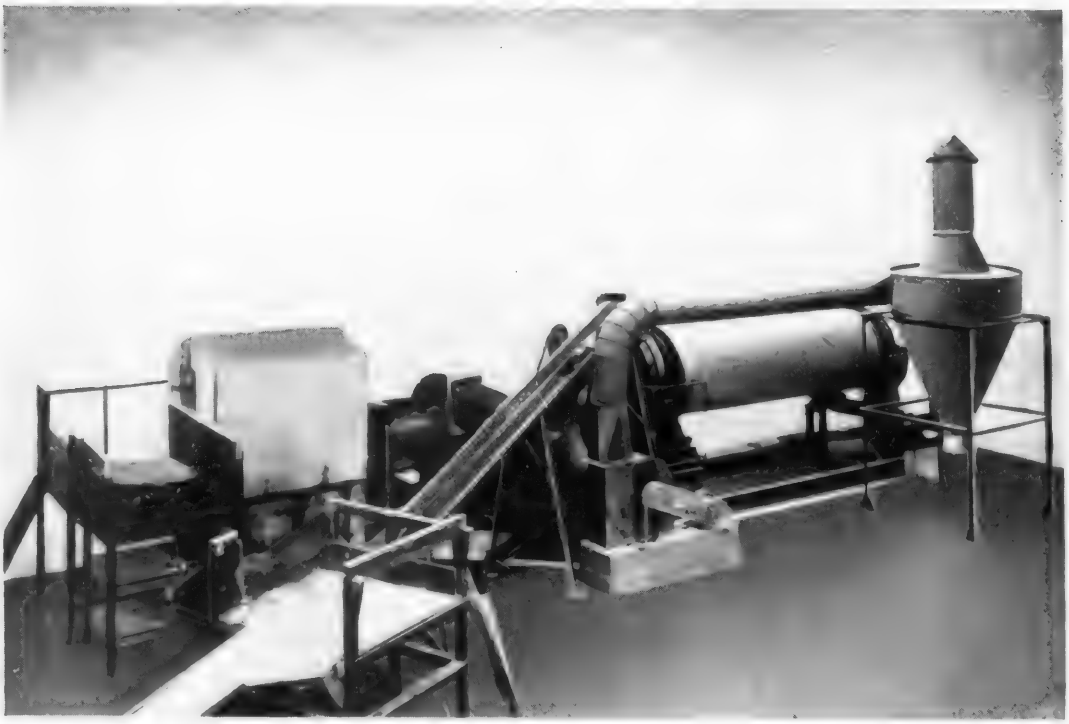

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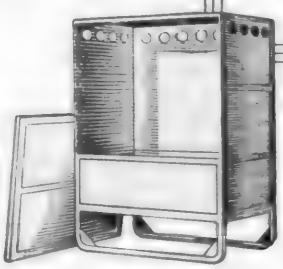
INDUSTRY IS TURNING TO ALUMINIUM TO SOLVE FREIGHT PROBLEMS

These **ALUMINIUM FOOD CONTAINERS PAID FOR THEMSELVES IN 12 MONTHS**



Strength, lightness, cleanliness, and longer life were four very good reasons for having these food containers built of 'Noral' aluminium alloy products. Compared with the weight in wood, every Aluminium Container saved 40 lbs., and this, in terms of reduced freight charges, cut 2/6d. off the cost of every return journey. In one year alone these freight savings paid for the difference between a bulky old-fashioned wooden structure and one built of strong, clean, splinter-proof, corrosion-resisting aluminium alloys.

In the food industry, aluminium is cutting useless deadweight and is giving added durability to many items of factory equipment. Consult our Advisory Service on any freight or factory equipment problem of your own. A solution may be suggested which may lead to a saving you did not expect.

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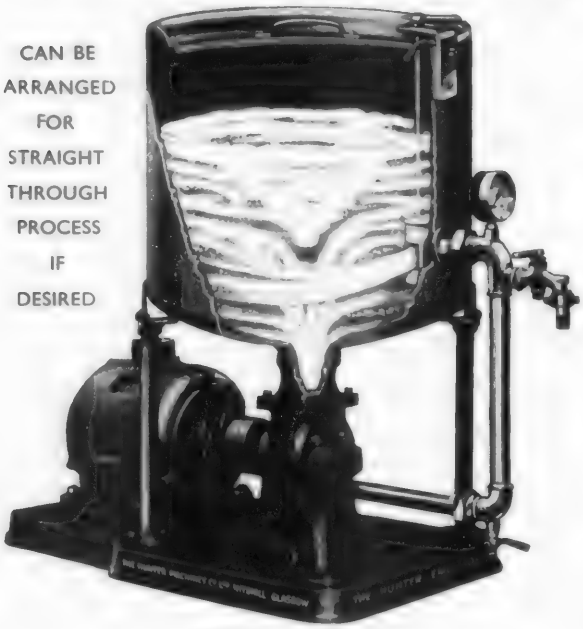
CAN BE ARRANGED FOR STRAIGHT THROUGH PROCESS IF DESIRED



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IT MIXES, IT EMULSIFIES, IT HOMOGENISES ALL IN ONE OPERATION

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EMULSIFICATION.—The continued circulation ensures perfect Emulsification.

HOMOGENISING.—The very high pressures obtainable break up the oil into infinitesimal globules, thus giving a stable Emulsion.

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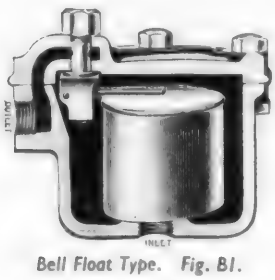
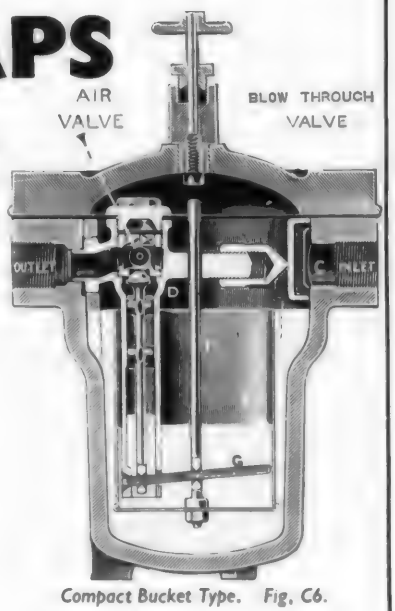
R.T.M. STEAM TRAPS

For all Pressures and Capacities.
Have withstood severest Tests.
Over fifty years' experience at your service.

Float Trap (non-Lifting).
Fig. F1.



Bell Float Type. Fig. B1.



Compact Bucket Type. Fig. C6.

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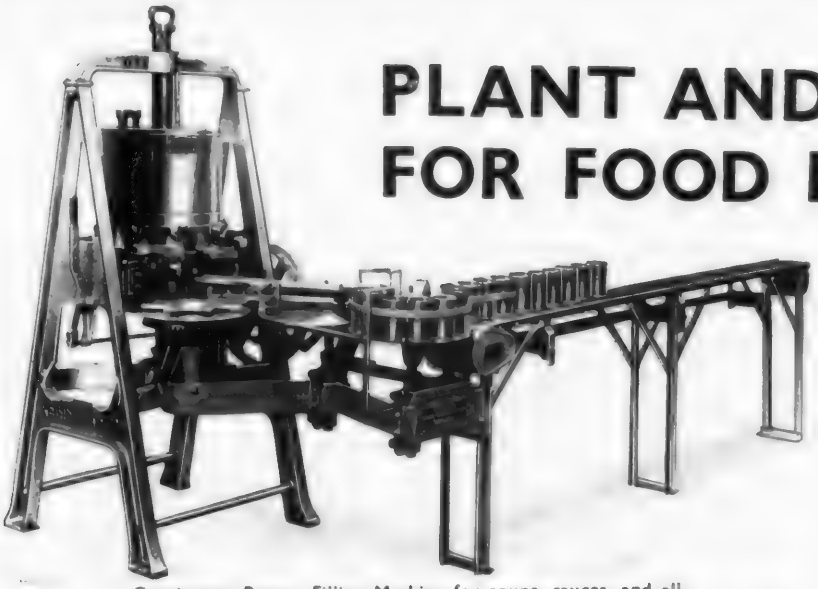
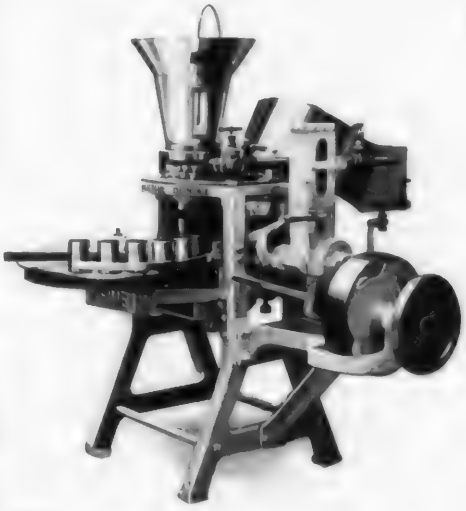
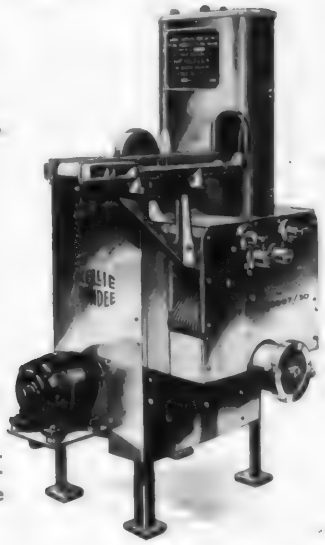


Continuous Rotary Filling Machine for soups, sauces, and all liquids, with no-can-no-fill arrangement. Type FP.

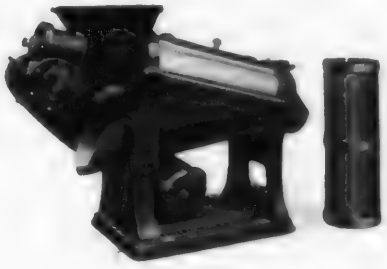


Rotary Pea and Bean Filling Machine with no-can-no-fill arrangement. Type FF.

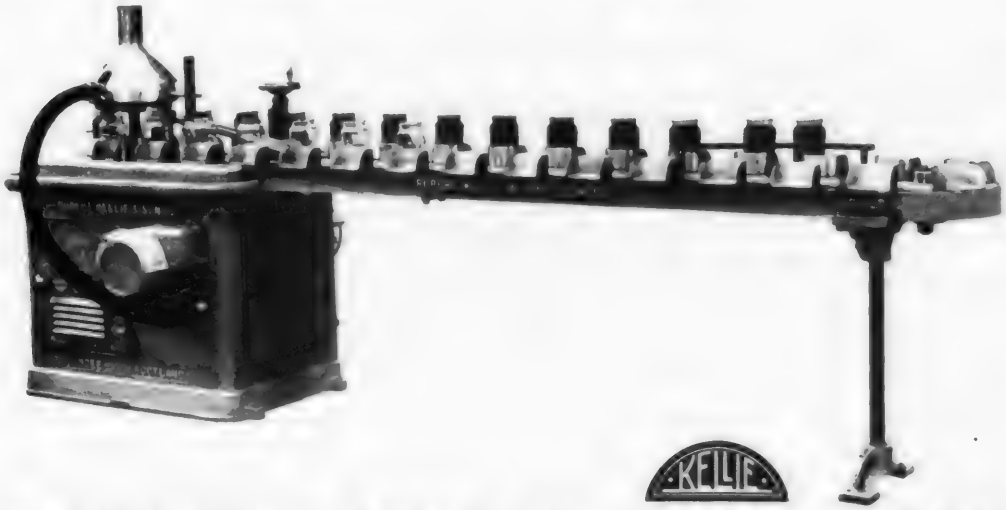
Continuous Rotary Steam Exhauster. Type EC. For all sizes of cans up to A3.



Patent Quartering, Peeling, Separating and Pulping Machine for oranges, lemons, tangerines, grape fruits, etc. Type JB.



Stainless Steel Pulping, Straining, Separating and Passing Machine. Type JA. With self-contained motor drive. Made in 3 Sizes. Also constructed in monel, nickel, inconel and aluminium.



New KELLIE Automatic Jam Filling Machine, Type 4 FP., with Patent Micrometer Regulator. Instant control of fill without stopping machine.

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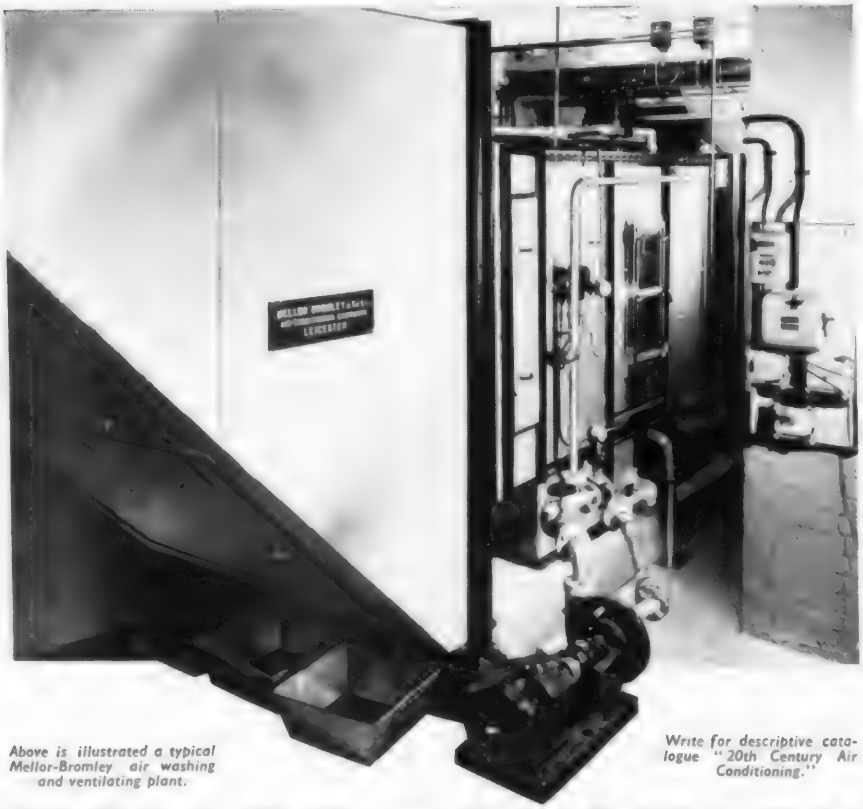

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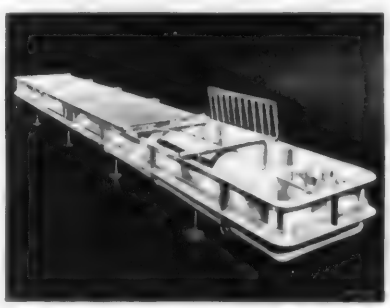

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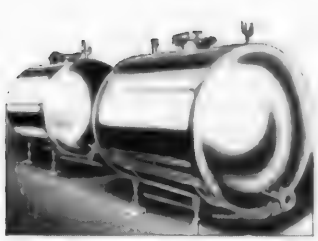

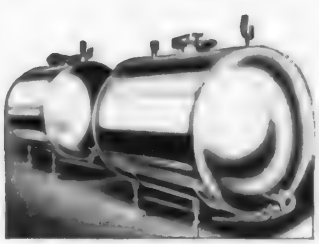

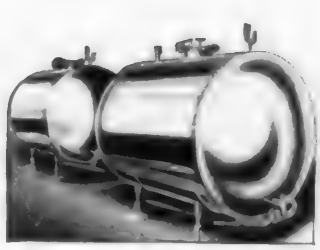

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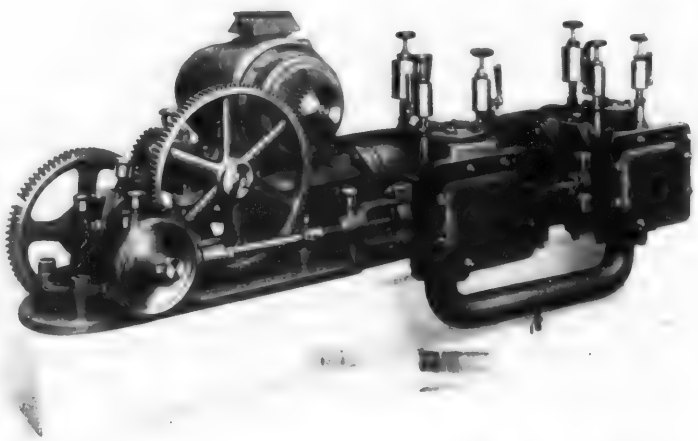

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SLIDE VALVE TYPE

Single or Two-stage giving a high degree of vacuum

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Messrs. J. & E. Hall Ltd., assure those same customers that they will spare no pains to give them complete satisfaction and the whole of their extensive resources and experience are available for this purpose.

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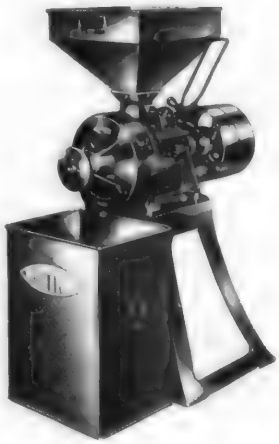


WHITMEE MILLS are successfully used for reducing BISCUIT WASTE TO MEAL, BREAD CRUMBING, NIBBING COCOA BEANS, ETC., and grinding all kinds of dry materials.

Makers also of STEEL CONE and LABORATORY MILLS, MIXERS, Horizontal and Vertical Types for dry materials.

ROASTING MACHINERY FOR FOODS, GRAIN, FLOUR, KERNELS, COCOA, ETC.

THE WHITMEE ENGINEERING CO. LTD.

(ESTD. 1831)

WEIR ROAD, BALHAM, LONDON, S.W. 12

G.E.C. ELECTRIFICATION

G.E.C. motors in a London margarine factory.

invariably provides

ADEQUATE POWER

with simple and easy control for individual and group drives—as well as

GOOD LIGHTING

- **VENTILATION**
- **HEATING**

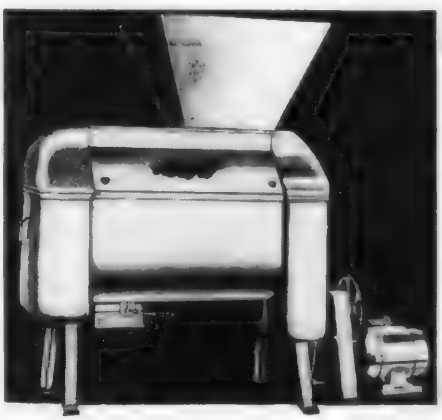
and other essentials to the efficiency and welfare of workers in Food Factories.

The G.E.C. undertakes complete electrification schemes of any size, using plant and equipment made entirely in England and in G.E.C. works.

Advt. of The General Electric Co., Ltd. Head Office: Magnet House, Kingsway, London, W.C. 2

THE average English housewife uses only 1½ lbs. of self-raising flour per week, but she might have gone on using So-and-so's self-raising flour for another 30 years or more.

If we count in the two young Newlyweds who take her advice on household matters, its easy to



see why her failure with "her special" cakes has cost the manufacturer his profit on 2 TONS of his self-raising flour.

Yet her 1½-lb. packet may have been the only part of the whole batch which had not received its share of perhaps *one* ingredient in the mixing.

Perfectly uniform assimilation of *all* ingredients throughout the *whole* of *every* mixing would have been ensured in a

GARDNER

Patent Combined 'Rapid' SIFTER & MIXER

For Self-raising Flour, Sponge and other Cake Flours, Custard Powders, Infant Foods, Salt, Gravy Powders, Soup Powders, Icing Sugars, Fruit Drink Crystals, etc., etc.

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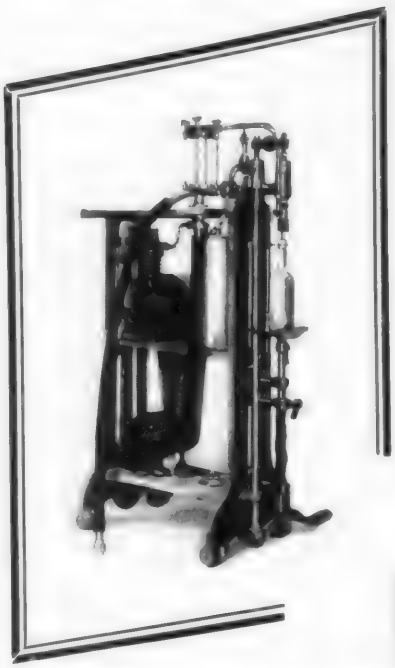
SINGLE, DOUBLE, AND TRIPLE HEAD MACHINES

LOW COST AND UPKEEP

HIGH OUTPUT AND EFFICIENCY

SELF-CONTAINED AND COMPLETE PORTABLE UNITS FOR ALL LIQUIDS



CLEAN AND RAPID FILLING. NO WASTE. EASY TO OPERATE

OUR TECHNICAL STAFF IS AT YOUR SERVICE

WE SOLICIT YOUR ENQUIRIES

ROBERTS PATENT FILLING MACHINE CO. Ltd.

BOLTON, Eng.

Phone : 661. **Grams : Filling, Bolton**

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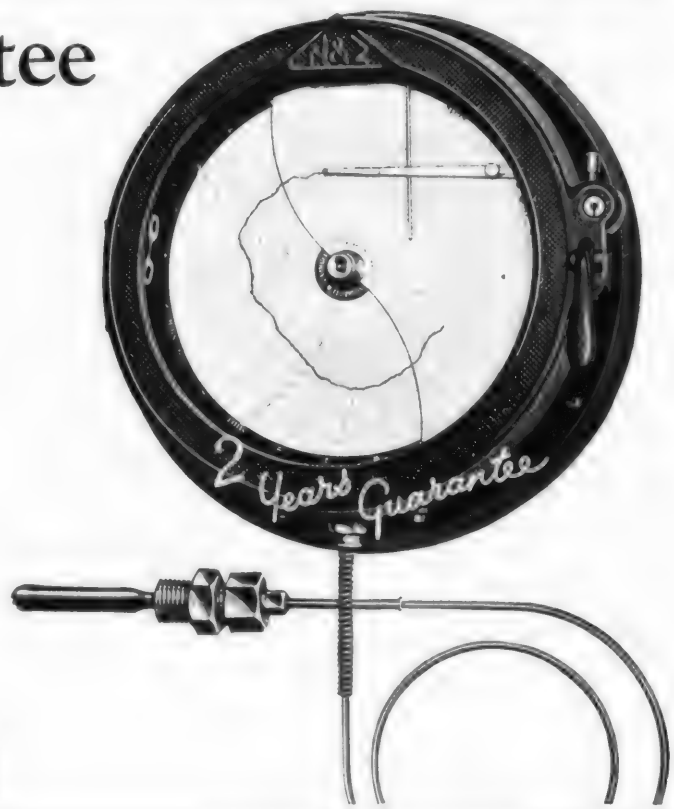
2 years guarantee

is given with our Automatic Controllers, Dial and Recording Thermometers and Pressure Recorders; every instrument is British made and of guaranteed accuracy.

Remember that the selection of instruments is equally important as the choice of any of your plant.



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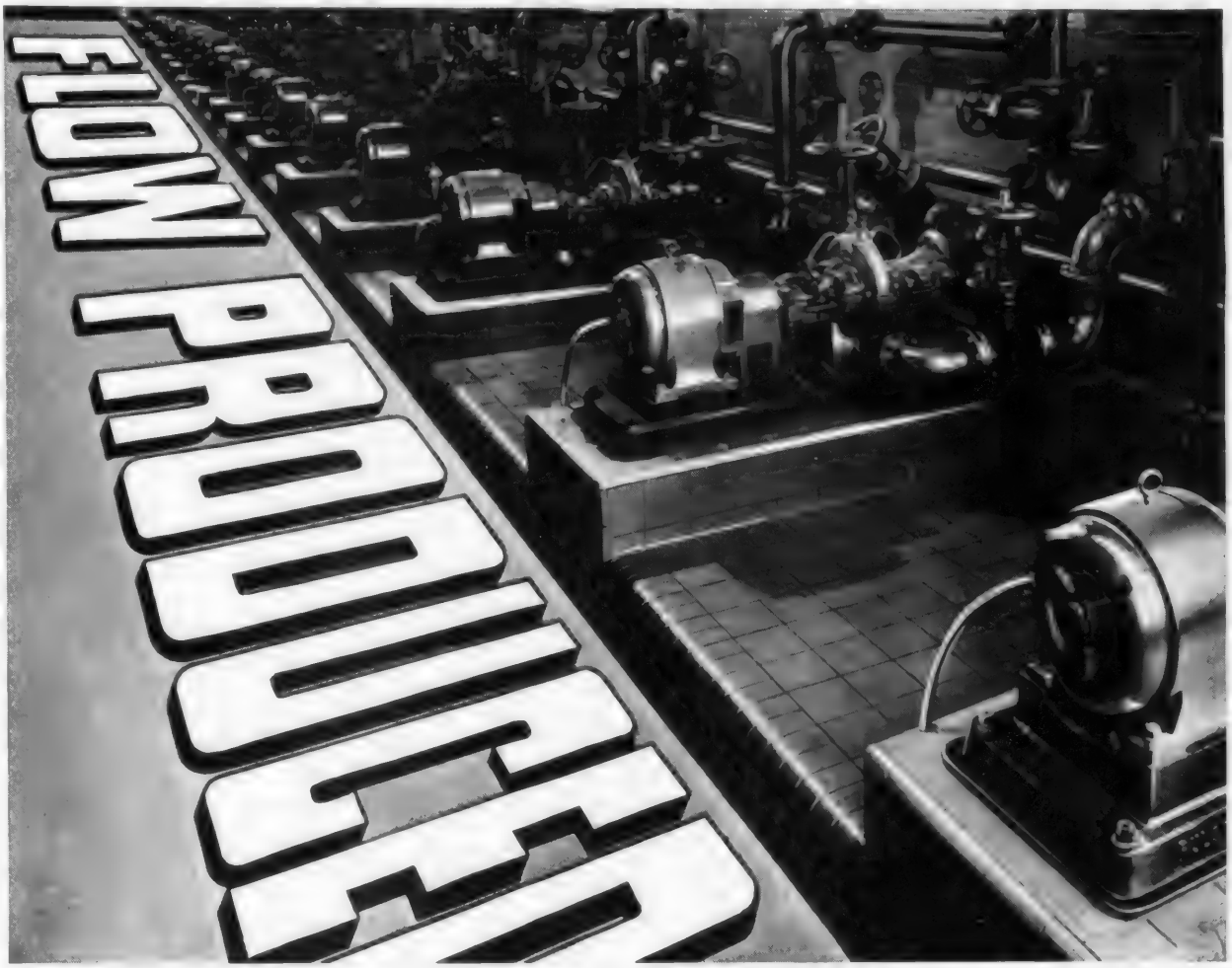
THE FINEST **A. C. MOTOR** SERVICE IN THE COUNTRY



A. C. MOTORS

From the moment you order your first Crompton Parkinson A. C. Motor from the Guiseley works, the most remarkable service organisation in the electric motor industry is at your disposal.

For instance, many manufacturers who produce motors for special purposes cannot supply direct from stock. You may require delivery in a hurry. We can manufacture a Crompton Parkinson motor for you complete in an emergency such as this, and yet give you delivery very nearly as quickly as if it had been waiting in stock. And you can be certain the delivery date will be kept. Only the Guiseley Flow-Production System and the extraordinary scope of our Standard range, make this possible.

Who could collect a motor a hundred miles away, fit a new rotor, shaft, and flanged endshield, and have it back in service in 24 hours? That is an actual example, and typical of many others of the Guiseley Service. It is at *your* disposal. Write to-day for full particulars.

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Derby Cables Ltd.
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MANUFACTURERS OF

All types of electric motors; generators; switchgear; transformers; electric traction equipment; instruments; paper and rubber insulated cables; ceiling and pedestal fans; Crompton and Kve lamps; lighting units; fire-fighting appliances.

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For Concentrated Food Value

A pure Yeast Extract made at Burton-on-Trent from Brewers' Yeast. Rich in Vitamin B. A most highly concentrated food, easily digested with the highest nutritional and health value. Possessing a pleasant aroma and flavour.

Today the public demand nutritional value in their foodstuffs. You can meet this need by using YEATEX in the manufacture of :

Soup & Beef Cubes
Canned Soup
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Savoury Sandwich Spread
Savoury Cheese
Savoury & Cocktail Biscuits
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Improved nutritional quality will increase sale of your products.

Also supplied in bulk to Wholesale Manufacturers for repacking and resale under their own proprietary name to the general public.

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Specialists to the Food and Beverage Industries for over 50 years.

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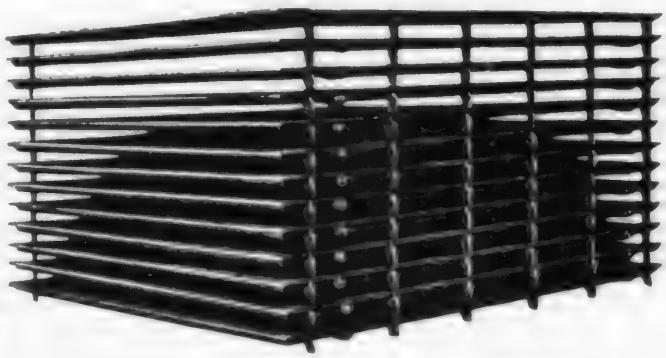
Gold Medal and Grand Prix 1935 Brussels International Exposition

★ *Right:* One set of Drying Plates, steam pressure 90 lbs. per sq. in. Thickness of upper plate, 6 mm ; of bottom plate, 5 mm.



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Above: Nickel Steel Forged Autoclave for internal pressure of 1,800 lbs./sq. in. Samka Piped externally for high-pressure water heating at 360° C.

"Samka"

PIPING *and* DOUBLE WALLS

You are invited to investigate the special advantages of the SAMKA Heat Transferring Constructions for the manufacture of modern Apparatus. Both these methods — the Double Walls and the Pipes—permit the highest Steam pressures to be used, and are applicable to a wide range of modern materials. Write for full explanatory literature.

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LONDON OFFICE: ARTILLERY HOUSE, ARTILLERY ROW, S.W.1

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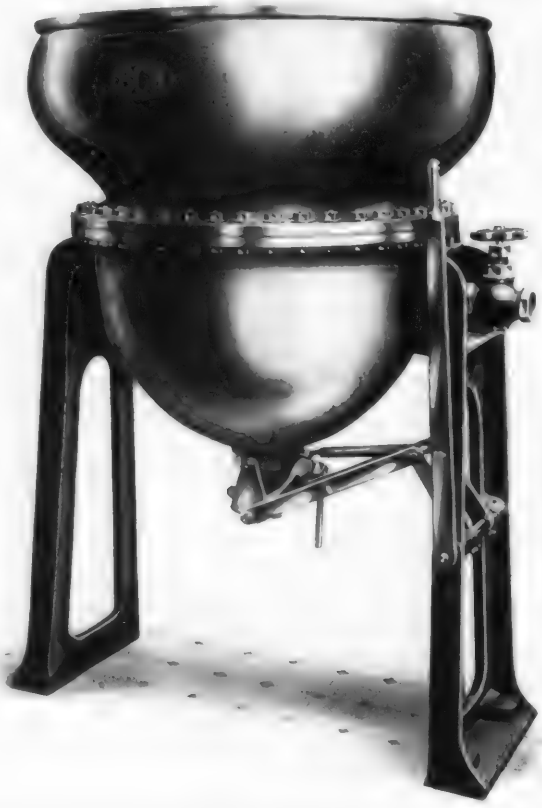

Rapid Boiling Pan, fitted with Steam Jacket also Central Steam Coil.

HEATED BY STEAM, GAS OR OIL

ALL TYPES & SIZES
IN ALL METALS

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STAINLESS STEEL
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TUBE
STAINLESS STEEL MILK PASTEURIZING COIL
2¾" X 16 G. TUBE WHICH REPLACED A TINNED COPPER COIL
TSC
APART FROM LIMITATIONS IMPOSED BY THE MATERIAL, WE CAN PRODUCE IN STAINLESS STEEL TUBES WHATEVER CAN BE PRODUCED IN ORDINARY STEEL TUBES.
AN INTERESTING EXAMPLE OF MANIPULATION IS ILLUSTRATED.
WHEN YOU REQUIRE MANIPULATED TUBES, LET US QUOTE.
TALBOT-STEAD TUBE Co. Ld.
WALSALL

The Well-known "Stitch in Time"

It's *easier*—and less expensive—to *prevent* gluing trouble than to stop it.

Before you adopt a new label or container, or start operations on any glue-using machine, consult our Service Department. We'll gladly recommend the right Mikah Glue, Gum, or Paste for your specific requirements.

NATIONAL ADHESIVES LIMITED

Slough——————————————**Bucks**

Telephone: SLOUGH 1000 (2 lines)

AN EXPLANATION of some applications of the VITAMINS A & D and some products in which they can be incorporated.

Natural Vitamin A (anti-infectious and growth-promoting) and natural vitamin D (anti-rachitic) can now be isolated in refined concentrates in the form of oil, emulsion or powder free from fishy taste or smell.

These concentrates may contain varying potencies up to 400,000 I.U.A. and 60,000 I.U.D. per gram in the form of oil, 200,000 I.U.A. and 30,000 I.U.D. per gram in the form of emulsion, and 35,000 I.U.A. and 25,000 I.U.D. per gram in the form of powder.

Following the tradition of science to present its researches to the world, these concentrates under the name of "Covitol" may be used without licence or restrictions of any kind.

The Vitamins in "Covitol" remain stable, even when incorporated with glucose or other powder products.

They may be used in many syrups and tonics without impairing appearance, taste or odour of the preparation.

They may also be employed in practically any foodstuff or pharmaceutical preparation without affecting its taste, smell, consistency or structure.

Experiments and tests to date show that there are few, if any, commercial products in which "Covitol" concentrates cannot be employed.

IF YOU WISH TO MAKE EXPERIMENTS WE WILL SEND YOU SAMPLES OF "COVITOL" AND FURTHER INFORMATION, OR WE WILL MAKE THE EXPERIMENTS FOR YOU IF YOU WILL LET US HAVE A SAMPLE OF THE GOODS YOU WISH VITAMINISED. FURTHERMORE, WE WILL CARRY OUT TESTS, INCLUDING THE LENGTHY AND COSTLY D TEST, FREE OF CHARGE, ON ANY OF YOUR PRODUCTS WHICH HAVE BEEN VITAMINISED WITH "COVITOL," TO ASCERTAIN WHETHER THE VITAMINISATION HAS BEEN EFFECTIVE AND UNIFORM.

Samples, quotations and information from the Agents for the U.K. and Colonies:

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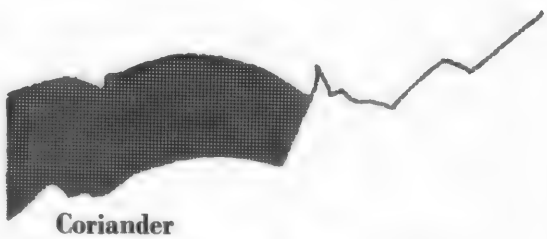
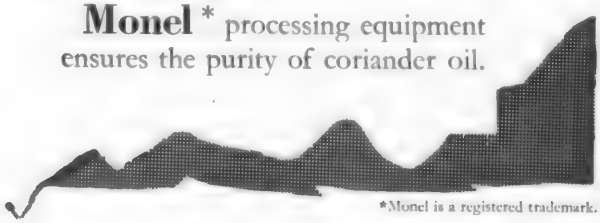


Coriander

Coriander seeds are the source of an oil employed in medicine and as a flavouring extract in the production of gin.

Monel * processing equipment ensures the purity of coriander oil.

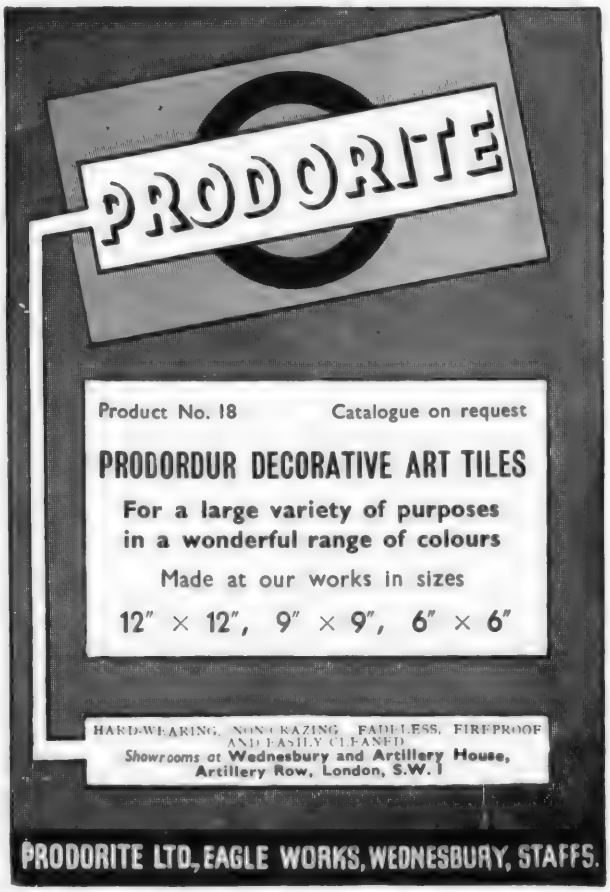


*Monel is a registered trademark.

See advertisement of

HENRY WIGGIN & Co LTD

page lxi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For a large variety of purposes
in a wonderful range of colours
Made at our works in sizes
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MODERNISE YOUR FOODSTUFFS FACTORY THIS YEAR

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VACUUM EVAPORATORS

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HIGH VACUUM COOLERS

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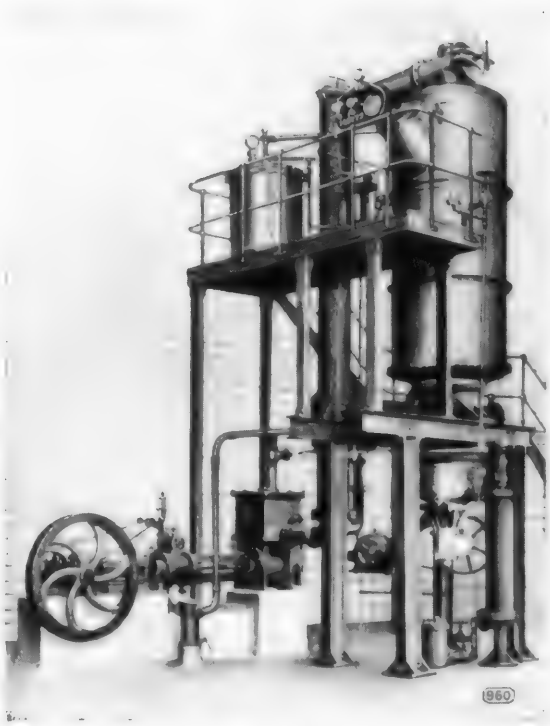
SOLVENT RECOVERY PLANT

Etc., Etc.



DESIGNED to give maximum efficiency and ease of access for cleaning

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CONSTRUCTED in materials which give freedom from corrosion and contamination, and ensure a long life with minimum maintenance costs.

Make use of our experience to improve your

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PRODUCTS

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GREEN ARROW SERVICE

for Urgent Orders

When clients demand immediate delivery, when the sender's reputation for Service is in danger—that's when the British Railways' Green Arrow facility saves the day. The "Green Arrow" is a system of Registered Transit for merchandise and livestock by goods train which ensures additional watchfulness over your goods throughout transit. The special "green arrow" label affixed to the consignment brings it immediately within a specialised control system. Every point along the route has warning of its coming, every railwayman handling the consignment is conscious of its urgency; and a trained staff keeps constant watch until the goods are safely delivered. The fee for this special service is only 2/6d. per consignment. Ring up your nearest Railway Station or Goods Office for further particulars of the "Green Arrow" Service.

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ELECTRIC MOTORS

Standard Industrial Motor Squirrel-cage Type.

A.C. or D.C.

There is a **B T H** electric motor for every drive in every branch of the food industry—constant or variable speed, reversing or non-reversing.

No other manufacturer can offer a wider choice of electric motors, with appropriate control gear, for every drive in every industry.

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HIGH SPEED CENTRIFUGALS

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CONTROL OF MOISTURE CONTENT

USED FOR

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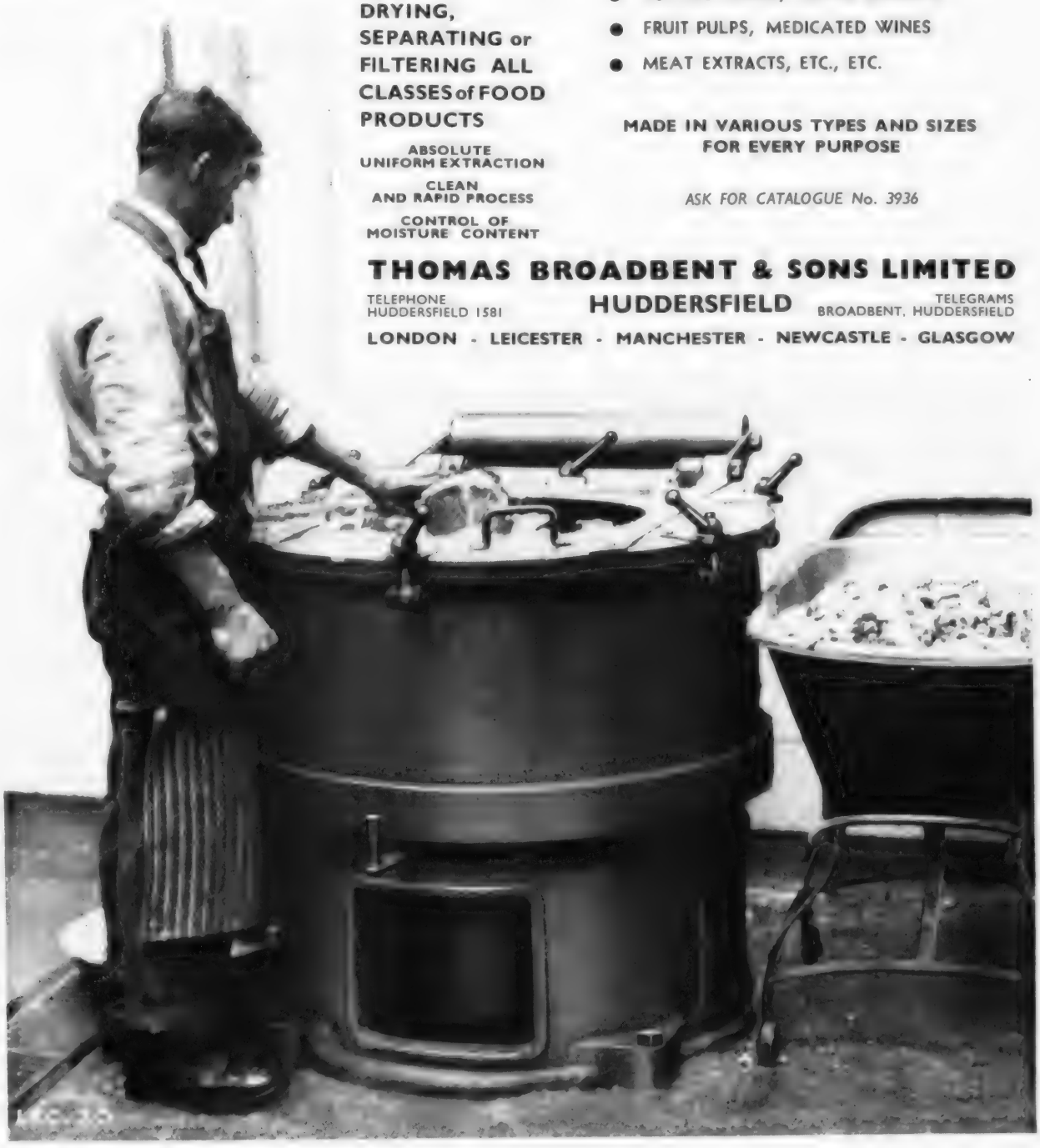

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GUARANTEED QUALITIES CONFORMING WITH FOOD AND DRUGS ACT, for Phoenix, Automatic and Reseal Caps, Sealing Compounds, and Gummi Rings, Rubber Moulds for Fondants, etc. Elastic Bands and every description of Rubber Goods for the Food Trades.

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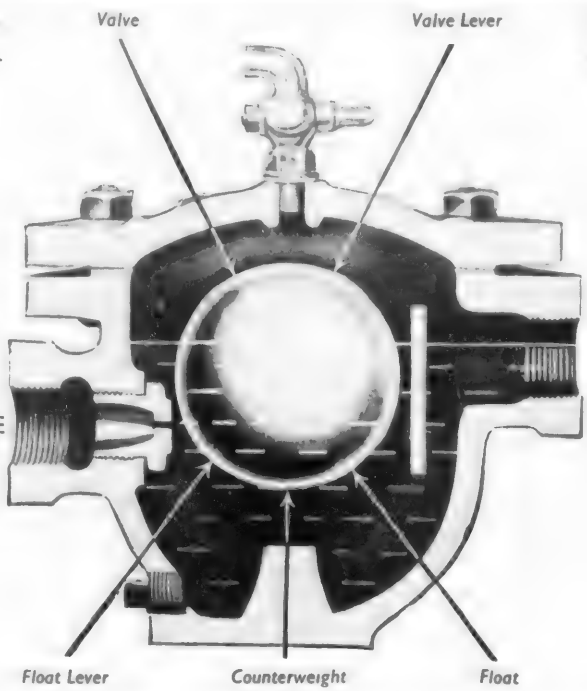

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"STAYBRITE" STEEL BALL

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MIXERS
Solve the problem

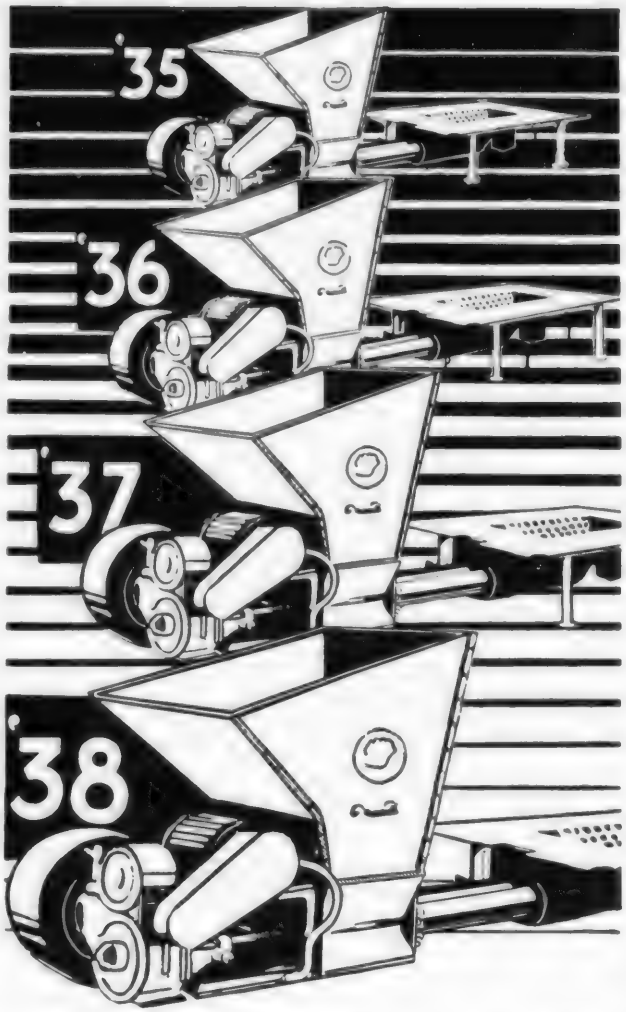
No matter whatever your mixing problem there is a CRYPTO MACHINE to meet your needs, from a small bench type to one of 80-qt. capacity. Furthermore, CRYPTO back their products with a special Advisory Service. If you have a mixing problem, don't hesitate, write to us about it without obligation.

Other Crypto Food Machinery includes:
Meat Mincers and Sausage Machines, Potato Peelers, Automatic Chip Cutters, Coffee & Spice Grinders, etc.

The Crypto 40-qt. Mixer embodies all the latest improvements. A special adapter ring is embodied to allow a 25-qt. Bowl Outfit to be fitted if required.

LANCASHIRE DYNAMO & CRYPTO LTD.
ACTON LANE, WILLESDEN
LONDON, N.W.10
Phone: Willesden 6363 (7 lines)

Write to Crypto about YOUR problem



For every heating application, including steam-raising, central heating, foundry core stoves, furnaces, bakers' ovens, etc.

ONLY GOOD VALUE FOR MONEY COULD ACHIEVE THE STEADY INCREASE IN THE SALES OF THE

Mirrlees' COMBUSTIONEER AUTOMATIC STOKER

MIRRLEES, BICKERTON & DAY, LTD.
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You may send a copy of your latest Stoker catalogue to the attached address. No obligation is hereby incurred.

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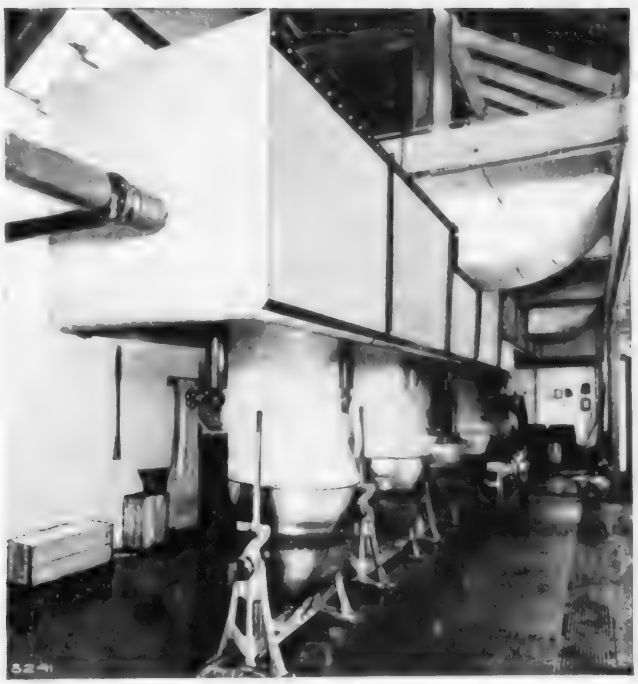

Steam Removal from Boiling Pans

The steam arising from boiling pans in confectionery and preserve factories can be effectively dealt with by a simple Sturtevant installation as shown in the illustration.

Our reference W101 will be pleased to supply particulars.

STURTEVANT ENGINEERING CO. LTD.
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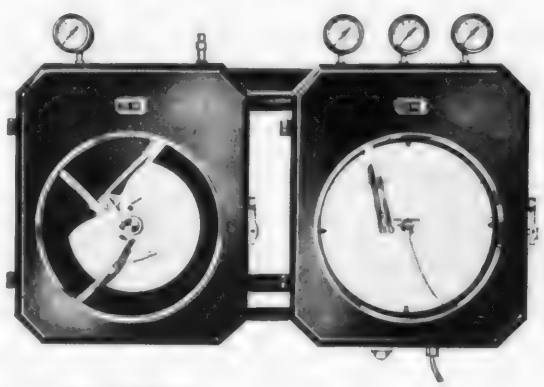
Once again
A LEADING PRODUCER MODERNIZES
WITH S. & M. CONTROL

MESSRS. A. HARVEY (J. & S. Alexander Ltd.) have Standardized on Short & Mason Controllers to ensure Accuracy of Control and Uniformity of Processing.

A slip in any one step of your canning process may mean losses not only in the prestige and quality of product, but losses within your plant as well. Messrs. A. Harvey (J. & S. Alexander Ltd.) have equipped their plant throughout with Short & Mason automatic control instruments, thermometers, etc., to ensure consistent reliable reproduction of laboratory standards.

Why not let us help you solve your problem? The wide experience and expert knowledge of our engineers are at your service without obligation. Full details from



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"The Instrument House"

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PURDY

The World's most complete range of LABELLING MACHINES

PURDY "WORLD" LABELLERS for bottles, jars, tins, cartons and other packages. Automatic and hand-fed models, placing up to three labels simultaneously on round, flat, recessed or irregular surfaces. Centre gumming. All-round labelling. Top-strapping or sealing. Automatic dating and counting attachments.

PURDY "NEW WAY" LABELLER for round cans. A high-speed, super-adjustable machine delivering up to 200 cans per minute. Positive change in about two minutes, without tools, to any size between 2 × 2 and 4¼ × 5 on model "M-H." Other models take larger or smaller sizes. Special Model "P-G" takes cans fitted for handles.

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LONDON

PURDY

AIR is an ingredient!

What quality do you use?

The air in your factory can constitute an important ingredient of your food product. If the atmosphere contains impurities, they will be absorbed as surely as if you had deliberately included them as part of the recipe, and in consequence your product loses its purity and capacity to "keep."

OZONAIR System of Pure Air Ventilation eliminates this danger, ensuring and maintaining the absolute purity of your foodstuffs.

The OZONAIR System has been successfully installed by the following:

Flour Millers
Biscuit Manufacturers
Confectionery Manufacturers
Chocolate Manufacturers
Jelly Manufacturers
Meat Pie Manufacturers
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Cooked Meat Manufacturers
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Kitchens
Refrigerating Stores
Holds of Ships
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Breweries

OZONAIR

Pure Air Ventilation

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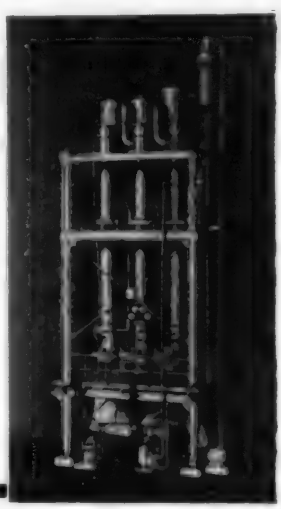

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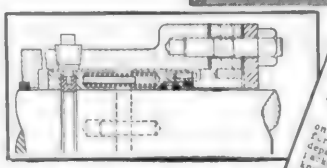

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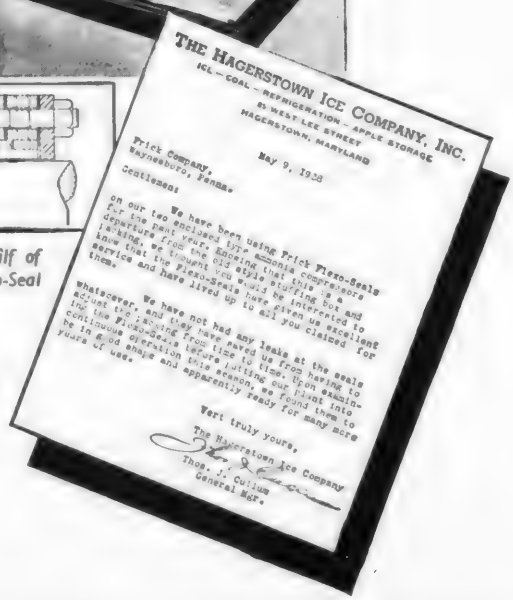
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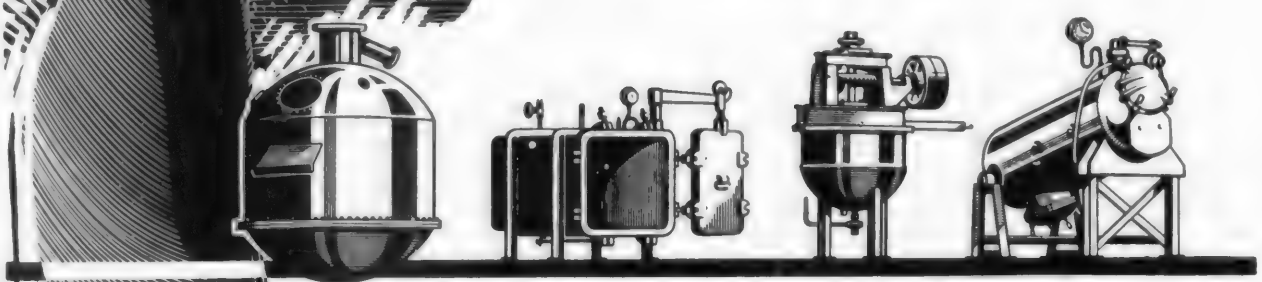

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Volume . . . XIV
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JANUARY . . 1939

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The Editor will be glad to consider contributions from those engaged in the Food Industry. Articles intended for publication should be of a practical nature and accompanied by photographs or drawings when possible.

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FOOD MANUFACTURE

Vol. XIV, No. 1 January, 1939

The Milk Bill

"THIS IS the Milk Bill that was," to paraphrase a well-known advertisement, sums up the position pretty accurately. After months of deliberation and investigation a White Paper was issued on the milk question and the obvious sequence of events was the framing of a Bill to put into operation the recommendations of the Commission and to eradicate many of the anomalies of the situation. The Bill duly appeared, but, stillborn. The second reading, which was to have taken place on December 5, was postponed indefinitely. Once again the Government have shown their vacillating policy in regard to agriculture. What manner of Government is this to appoint Commissions and Committees of Enquiry, and then deliberately ignore the recommendations at which they arrive? It happened in the case of the Greene Commission on Sugar—the minority report was accepted.

Now, in the face of vigorous opposition by vested interests, the Government have wilted and taken the line of least resistance once more. Much opposition has been raised on the question of compulsory pasteurisation, and it has been said that if pure milk is insisted upon many small dealers will be forced out of business.

Surely the whole question is one of ensuring a pure and wholesome supply of milk, so vital to the health of the nation, and not one of keeping inefficient producers in business. We are not so much concerned with the size of a man's herd as with the purity of his produce. We have a suspicion that the possible troubles of the small producer have been made a cloak to protect the vested interests of the milk distributors. We have always felt that as the farmers have failed to control their affairs properly themselves, the job should be undertaken by an independent body. This is what the Bill would have done, but that did not suit the Marketing Board and the Farmers' Union, hence the opposition, the Government's weakness and a postponement and possibly an abandonment of a real and genuine effort to put the affairs of the milk industry in order.

More Pig Muddling

It may seem rather persistent on our part to devote still more attention to the pig problem. As will have been noted by letters recently published in this journal, there are people who believe that everything in the pigs' garden is lovely. The fact remains that many complaints have arisen about the allocation of pigs under the equitable distribution arrangements in the Pigs Marketing Scheme. Even the *Farmer and Stockbreeder* is forced to say "Perhaps it was inevitable that there should be some anomalies, but it could hardly be necessary that they should be so numerous and so glaring", and further, "Diverted pigs will have to cross each other in a rather amazing manner, and the benefits of reducing journeys to a minimum that should have been secured have been largely lost". That statement is singularly like the sentiments we expressed in our November issue to which some of our readers took exception.

There is as yet no evidence of that co-operation between the two Boards in the matter of transport which is so essential to the smooth working of the scheme. An efficient transport officer is needed to make the study of pig distribution a whole-time job. One of our correspondents wanted evidence as to the sending of pigs to out-of-the-way places.

In an article in our above-mentioned contemporary for December 6 we read that pigs are to travel as far as from Northumberland to Wiltshire. Pigs from Orkney find a natural market in Aberdeen. Having done the sea journey they must now embark on a tiring rail passage to Glasgow, while the Aberdeen market will draw upon supplies far south of the district. West of Scotland pigs are being sent to Yorkshire, and Glasgow pigs to Birmingham. There are many more glaring ex-

WE WISH OUR READERS A HAPPY NEW YEAR

amples of this muddling, and with all due respect to the opinions of our distinguished correspondents we still believe that all is not well with the pig industry.

Land Fertility

We referred some months ago to the Government's proposals to aid farmers by enabling them to buy lime and basic slag at favourable prices.

The first report of the Land Fertility Committee was published on December 5, and this shows that the scheme met with a ready response from the very beginning in September, 1937. Within a fortnight, applications for the State contribution were being received at the rate of over one hundred a day. Within a month the daily average rose to 1,000, and by the end of last month over 300,000 applications had been received, representing 2,160,000 tons of lime and 577,000 tons of basic slag.

It is estimated that the total quantity of lime used on the land has been four times as great as in the previous season, and that the quantity of slag used increased by 70 per cent., and this would have been greater if more had been available from the steel works. We hope that this material is being used judiciously and to the best advantage. Passing through the Midlands a little while ago we noticed fields in which heaps of farmyard manure and lime were arranged alternately. There should be a ripe smell of ammonia when these get mixed!

A little advice on general principles of fertilisers would be helpful to many farmers who, after all, are not chemists and in the past have relied on their animals to synthesise their fertilisers for them. It is curious to note how some counties have made more use of the scheme than others, and while Devon made 12,553 applications only 886 came from Wiltshire. A serious limitation to the value of the scheme is that no provision is made to assist farmers whose land needs drainage before the lime can be used to advantage, and probably in many cases the lime has been absolutely wasted.

Barley

There is considerable unrest among the producers of barley in this country and an insistent demand for some sort of protection for the barley grower similar to that provided for the wheat grower by the Wheat Act. It might be possible to put a quota charge on every barrel of beer brewed, the proceeds to be passed back to give the growers a guaranteed price. Among farmers the view now generally expressed is that the best remedy for low malting barley prices would be an import duty of £1 a quarter on foreign malting barley; other barley, intended for stock feeding, to be admitted duty free if kibbled or stained.

All this works back to the old argument about quality. The position is different from that of wheat, where the home production is only a small proportion of the total consumption. The brewers are against the duty on foreign barley on the grounds that if they did not use a grain of malt made from imported barley, they might use 75 per cent. of the home crop, but it would be impossible to maintain the special qualities of certain types of beer which the public now expect.

At the recent conference at Rothamsted the experts did not consider the barleys exhibited to be of a very high standard, but a vice-president of the Brewers Society maintained that from a malting point of view this year's barleys were the best he had malted for a long time.

In the consideration of the demand for malting barley it must be remembered that the production of beer has fallen off by more than one half in the past twenty-five years. Restoration of the duty on beer to the pre-war level would do much to create a demand for malting barley by stimulating a great consumption of beer. Whatever else one may say it is certain that barley growers are badly hit by the prices this year, and some may give up growing it in spite of the additional 10s. per acre subsidy just granted by the Government.

Fruit Juices

The development of the production of unfermented fruit juices has been very rapid abroad, and there are evidences that it will grow vigorously in this country. There was a round-table conference on the subject during the Imperial Fruit Show at Bristol, and it is important that this section of food industry, which is likely to have rapid expansion, should be placed at once on a sound businesslike footing. There have been so many mistakes made in the past, and such a deplorable lack of system and imagination that when there is the possibility of a new industry, every effort should be made to put it on a real economic basis for its rational development.

Many difficulties have been encountered in the technical processes for the stabilisation of apple juice, and it is essential that would-be factories should be equipped with the right kind of plant and provided with its adequate technical person-

nel. The setting-up of innumerable small factories is to be deprecated; a few large and properly equipped plants would be far better.

Another point of importance is to get legal standards at the beginning which would protect pure juices against spurious imitations. As was the case with jam, it is bound to come sooner or later, and the sooner the better. The obvious procedure is for the fruit-growers to run the fruit juice business on a sort of co-operative basis by building several adequate factories in the fruit areas and, by careful planning, avoid unnecessary handling and transport of the fruit. It is a fine and almost unique opportunity for prime producers to organise and stabilise a new industry on sound lines. Will they do it?

High-Speed Mixing

For some years the baking industry has been offered all sorts of "high speed" mixers, but apparently the only factor taken into consideration has been the high speed. There have been no definite standards by which to assess the relative degree of mixing action accorded the doughs per unit of time. The term "high speed" has covered a variety of actions, but in general the machines which fall into this category have been more vigorous and rapid than the older types of single-arm slow-speed mixers.

With the development of this type of machinery it became increasingly important to investigate what effect this vigorous treatment has on the dough and to correlate if possible the speed of mixing with the baking properties. An investigation on this point has just been published by Stamberg and Bailey, of the Division of Agricultural Biochemistry at Minnesota. Briefly, the investigation showed that a medium to moderately high mixing speed resulted in superior bread. With reduced speeds the bread was inferior even when the optimum time of mixing for that speed was allowed. This may be the consequence of the relatively long time requisite for dough development. High-speed mixing resulted in satisfactory bread when the mixing time was carefully adjusted, but the bread made with medium mixing speeds was rated higher.

It is suggested that a further advantage of medium speeds is that the range of time through which mixing can be continued for optimum results is much less narrow than when higher speeds are involved. This is important in the case of weak flours, which may easily be overmixed at the higher speeds.

Synthetic Meats

It is a somewhat intriguing thought that the same statement or question may be both a compliment and an affront, depending upon the person to whom it is addressed.

In the December 2 issue of our contemporary, *Food Industries Weekly*, appears a letter asking about synthetic foods, in which the writer avers that a somebody-he-knows-knows-somebody who had worked in a factory where meats were being made from wood pulp, and also that he had read an article in a newspaper in which hams were tabulated as one of the synthetic foods.

The food industry may well take exception to such statements, but—what a compliment to the chemists! With what pride (and, incidentally, with what possible profit to the food industry) would the chemist place before his particular learned society the details of the preparation of a bit of protein, with its structure, its due admixture of bases, salts and the like, all from some roughly treated cellulose.

In the old days (whether bad or good depends upon the point of view), when hapless children were not stuffed with elementary chemistry for the purposes of "school certificate" or matriculation, there might have been some excuse for the many fallacies on common things which unfailingly cropped up. We remember that one was that extract of beef was made from old horses, an obvious error at any time. Whether the continued existence of these popular beliefs is a reflection on modern education is another story, but we recently asked a bright schoolchild what bread was made of. "Flour and yeast," was the prompt answer. But the enquiry "What is yeast?" resulted in the complete confusion of the said child.

Cabbage Water

Cabbage water has been a good standby for the humorist in describing the smell of boarding-houses, but now it seems to offer a certain amount of hope to sufferers from diabetes mellitus, the inroad of which disease has to be checked by somewhat exacting treatment with insulin.

Remedies which can be taken by mouth have been a dream which may come true, the work of A. D. Macdonald and L. Wislicki (*J. Physiol.* 1938, **94**, 249), who were struck with the evidence that plant extracts may influence blood-sugar concentration, including certain clinical observations that diabetics tolerate carbohydrate eaten as vegetables better than carbohydrate in other forms.

They used an extract of cabbage which caused a reduction in the blood-sugar concentration of normal rabbits, the dosage determining the intensity of effect. The extract is as effective when taken by the mouth as by injection. Another experiment was performed on a de-pancreatised dog kept alive by injections of insulin. It was found possible to control the blood-sugar and glycosuria with the cabbage extract alone and to withdraw the insulin entirely. A two-day interval between withdrawal of the cabbage extract and resumption of insulin therapy was marked by an abrupt rise in the concentration of glucose in the blood and urine.

It would probably be premature to be too certain about the possibility of replacing insulin by the long-sought method of a remedy taken by the mouth, but this work will certainly be encouraging to diabetics.

Acid-Base Balance

The dietetians at present are treading gingerly on the subject of acid-base balance, and one of the latest books on nutrition mentions that an excess of foods yielding an acid residue is often thought to be harmful, but that Dr. Sherman and others consider that more evidence is needed before a final decision can be made. Jehiel Davidson and J. A. LeClerc have written a valuable paper on the acid-base balance of cereals and some related food materials, published in *Food Research*. They point out that the knowledge of th acid-base balance of the ash constituents of foods in animal and human nutrition is not fully determined, and that experiments with well-established uncontradicted results are wanting, possibly because of the laborious and time-consuming calculation method previously used for the determination of the acid-base balance of foods. The authors have developed a simple and more direct method in their laboratory, which yields results quite comparable with those obtained by the old calculation method used by the same workers. The new method also has the advantage that it furnishes values for the total alkalinity or acidity of the ash in addition to the acid-base balance values of the food materials, as it is possible that in future studies of nutrition certain results may be correlated directly with this factor.

For the purpose of this research the new method was applied to determination of the acid-base balance of the more common cereals and of some related food materials. Davidson and LeClerc have found that—

(1) All cereals tested, with the exception of yellow corn, have a slightly alkaline ash; all, however, have an acid balance.

(2) Buckwheat, which is commonly used as a cereal, has an alkaline ash and slight base balance.

(3) Standard wheat bread has a distinct alkaline ash, but the balance is acid. The alkalinity of the ash is due to the loss of chlorine from the sodium chloride used in baking.

(4) Soybeans, jack beans, and potatoes have a distinct alkaline ash and a distinct base balance.

(5) The loss of chlorine during ashing is correlated with the acid or base balance. The cereals with an acid balance lost all their chlorine during ashing; the other materials, with a base balance, retained practically all their chlorine.

(6) The transformation of phosphorus into metaphosphate and pyrophosphate during ashing is inversely correlated with the alkalinity of the ash, especially when the alkalinity is recalculated on the uniform basis of 1 per cent. phosphoric acid.

(7) The loss of sulphur during ashing is not correlated either with the acid-base balance of the materials or with the alkalinity values of the ash.

(8) It is suggested that the significance of the acid-base balance, if any, besides its possible contribution to the acid-base equilibrium of the animal or human system, may lie also in its effect on the end products of mineral metabolism.

The foregoing is a valuable contribution to the subject.

New Zealand: The Ottawa Agreement

From statements made during the last few weeks by Mr. Savage, the New Zealand Prime Minister, and Mr. Nash, the Minister of Finance, it would appear that, owing to certain internal financial difficulties, the New Zealand Government intends to limit importations, quota, licenses and other means. As a result of this, the Federation of British Industries has sent a letter, dated December 15, to the President of the Board of Trade stating that it is "gravely apprehensive about the results of the policy of the New Zealand Government upon future New Zealand-United Kingdom trade. If the administration of the new system is going to result in discrimination between different classes of articles hitherto imported into New Zealand, the position then created would amount to a breach of the Ottawa Agreement. In that event, the Federation would have no option but to press His Majesty's Government of the United Kingdom to abrogate the Ottawa Agreement at present in existence and to negotiate a new one".

"*. . . The tongues are cooked in the usual way and set to foot shape. They are then glazed and decorated with thin strips of gelatine . . . the final touch is a paper frill at the root end of the tongue . . .*"

MEAT PACKING THROUGH SEVENTY-FIVE YEARS

THE STORY OF THE HOUSE OF HARVEY (J. & S. Alexander, Ltd.)

BY T. CROSBIE-WALSH, F.I.C.

HERE WE have one of those characteristic old-established firms which have blazed a trail in food manufacture preserving their individuality for a good part of a century.

Seventy-five years ago, two brothers, James and Samuel Alexander, started curing tongues in an establishment in Lime Street, London. Other products prepared were sweetbreads and cooked tongues sold in cardboard boxes. The Alexanders were among the pioneers in the packing of tongues in tins; in fact, they say that perhaps they were the first, but cautiously add that one of the other firms might have been a week or so before them! However, a week or two in seventy-five years is not vital.

Growth of Business

The business grew and the firm, which now carried on under the business name of A. Harvey, followed their tinned packs by meats in glass moulds. By this time a new factory in Buckingham Palace Road had been acquired, and appropriately the brands "Belgravia Brand" and "Buckingham Brand", which are still well known to consumers of high-grade preserved meats, were started.

The premises at Buckingham Palace Road were soon found to be inadequate to handle the rapidly expanding business, and larger ones were built at Norton Folgate in 1902. The present and still larger premises were occupied in 1915. These are situated in Marlborough Road, Upper Holloway, and the old name of "Belgravia Works" is retained. William Brand Alexander, nephew of the original partners, joined the firm in the year 1882, and was still taking an active interest in the business of the firm up to early this year, when he passed over, in full possession of his faculties, leaving a fine, old-established and flourishing business as a monument to more than half a century of active work in the food industry. He was a man of fine type and high ideals —one of those who have brought lustre to British industry.

The business is now controlled by Mr. William Brand Alexander's two sons, W. S. and E. G. Alexander, who joined their father over twenty years ago and are now carrying on the old traditions.

The range of products has, of course, been considerably extended since the old days, but the Alexanders still pride themselves on their original tinned and glass-packed tongues.

Scrutinising, from every conceivable aspect, recently made packs in ". . . . a room adjoining Mr. W. S. Alexander's sanctum."

Inspection of Products

In a room adjoining Mr. W. S. Alexander's sanctum is a huge table, upon which each day is spread an inviting-looking selection of recently made packs. Each batch is meticulously scrutinised as to taste, colour, tenderness and every conceivable attribute of preserved meat.

Constant touch is maintained with the responsible heads of the different departments, and knotty points are fully discussed personally with the directors. In this way an excellent team spirit has been built up, and it would be difficult to find a keener and more enthusiastic spirit reigning among the entire staff.

Preparing the meat in a department next to the refrigerating chambers.

The Refrigerating Chambers

The raw material consists of fresh English and Scotch meat, which immediately goes forward for treatment, and frozen and chilled meat, which is immediately placed in the refrigerating chambers, which are equipped with modern appliances for the control of temperature and humidity.

Meat Preparation Department

Adjoining the refrigerating chambers is the department where the meat, tongues, etc., are prepared. Defrosting is the first operation, and this is carried out by different methods, depending upon the nature of the material handled. Here, also, the boning and trimming of the meat is done, and the material emerges ready for the subsequent operations.

Tongues in the process of being pickled in one of the huge slate brining tanks.

Brining Room

Along the sides and centre of the brining room runs a long line of pickle tanks made of slate. Here are prepared a wide range of products, such as tongues, briskets and pork for brawns. In a special part of the brining room the used pickle is purified and re-constituted, according to the latest methods.

Cooking Department

Two light, capacious, well-laid-out rooms house the large number of jacketed pans, which never appear to be empty for any length of time. The impression of a super-kitchen is heightened by the spectacle of a constant

stream of men, dressed like chefs, feeding, loading and unloading the pans, putting their contents on to a central table, where they pass through a further step towards the final stages. Tongues are trimmed and skinned still further; briskets are trimmed.

Cooking is carried on by men who can claim to be real artists in their job, as conversation with them speedily demonstrates. Each item of meat, tongue and suchlike is treated on its own merits, and the true culinary atmosphere obtains, which is an achievement when it is considered that it is combined with large-scale working. Here also are prepared the different stocks, jellies and glazes which are used for such products as briskets.

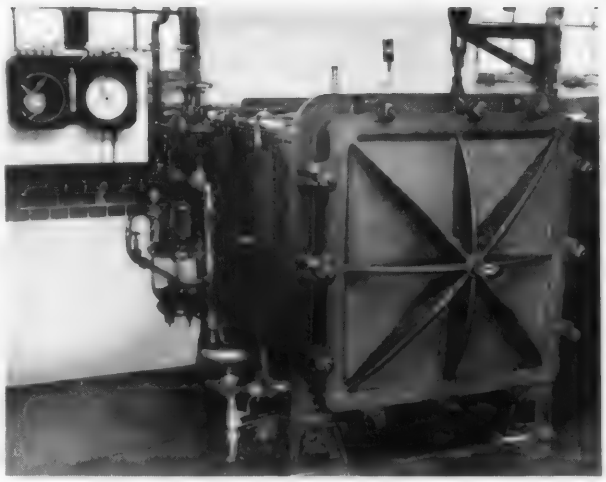
Canning Department

This department is replete with up-to-the-minute plant, such as completely automatically controlled retorts which look after the entire sterilisation process from the time the door is shut.

The only human intervention in the whole job is loading the retorts, closing the door, setting the control mechanism, opening the door at the end of the operation, and unloading the tins or glasses.

The tins and glasses are filled with the different products. The filling of glass moulds is a veritable art in itself, especially when there is a mixture of meats put into the mould. Here is seen dexterity *par excellence*. Each glass must appear as identical to the next one as is humanly possible—a not entirely easy business. Everything is conducted under the most hygienic conditions, with the minimum of handling.

The filled cans are vacuumised in two different ways. In some cases the cans are delivered from the double seamer on to a conveyor, which takes them to the vacuum closing machine, from which they are loaded on to the retort trucks. Another method is to perform the closing and vacuumising operation simultaneously by a vacuum double seamer.



A retort in the canning department. On the left can be seen the fully automatic control instruments.

Through the retorts go cans and glasses filled with such a diversity of preserved meats as tongues, briskets, brawns, galantines, chickens, English hams, gammons, jellied veal, shrimps, cocktail sausages and fish and meat pastes.

Tongues

The tongues are first pickled in brine, after which they are partially boiled to expel excess moisture. They are

The cooking department, where " . . . the impression of a super kitchen is heightened by the spectacle of a constant stream of men, dressed like chefs, feeding, loading and unloading the pans . . . "

"The tongues are first pickled in brine, after which they are partially boiled to expel excess moisture. They are then skinned and weighed."

then skinned and weighed. The prepared tongues are put into different sized and shaped cans. Another important item is tongues in glass moulds, and there are some very attractive packs in which sliced tongue forms a constituent. Tongues also go into such goods as galantines, etc.

Briskets of Beef

The briskets go through the usual pickling and boiling process, the time of boiling depending on the sizes of the briskets. They are then packed into pressing trays, and sold either in the form of glazed blocks or packed into tins as a sterilised article.

Galantines

These consist of finely chopped meats, the meats depending on the type of galantine prepared. For instance, there is chicken, ham and tongue, and turkey and tongue galantine, among others. Some of these galantines packed in glass moulds are veritable works of art. Looking at the bottom of the mould is to be seen a colourable representation of a sunflower, the sunflower being tricked out with egg, the black (eye) being made of truffle; green stems are supplied by gherkins, and further ornamentation pistachio kernels and red pimento.

Boars' Heads

Large numbers of boars' heads, suggestive of the Christmas season, were ranged on a long table, awaiting the traditional decorations.

Glazed Tongues

Another decorative item is glazed tongue. The tongues are cooked in the usual way and then set to foot shape.

"... the cans are delivered from the double seamer on to a conveyor which takes them to the vacuum closing machine ..."

They are then glazed and decorated with thin strips of galantine, and the final touch is a paper frill at the root end of the tongue.

By-Products

The by-products of the factory, such as bones, meat cuttings, etc., are made into meat meal, bone meal, and dripping.

The material is loaded into steam-jacketed cylinders fitted with paddles for the agitation of the material during drying. During the drying process a portion of the edible fat separates. The hot material is then passed through the centrifugals, which separate further quanti-

ties of fat, and from thence passes on to the disintegrators, which both grind and sift the material, which is then ready for use as feeding stuffs.

Showcards

Showcards are prepared on the premises in many designs and sizes, and these are supplied to retailers.

Packing

Wooden boxes, fibre-board cases, cardboard cases are all used as packing materials. The labelling of such a bewildering assortment of shapes and sizes of glasses, jars, tins and bottles is a complicated business, but Alexanders' packing and labelling room is a model of quiet efficiency which could not have been achieved save by considerable attention to organisation. The same remarks apply to the departments dealing with storage and dispatch.

Can Making

Harveys have a can-making department of their own, in which they make a variety of different shaped containers. They do not, however, rely entirely upon this department for their empty cans, but draw very extensively upon the products of well-known suppliers.

Mobile Advertising

A. Harvey's vans, upon the sides of which are depicted appetising illustrations of some of their products, are a familiar sight in the streets—excellent advertising. On glancing finally around, the impression that is taken away is that Messrs. A. Harvey are by way of being one of the "Admirable Crichtons" of the meat preserving industry and that the organisation has that special individuality necessary to any concern which holds its own in these days of strenuous competition.

SOME SUPPLIERS TO A. HARVEY'S FACTORY

Refrigerating Plant: The Lightfoot Refrigeration Co., Ltd.
boilers: Davey Paxman and Co. (Colchester), Ltd.
Glass Containers: Rockware Glass Syndicate, Ltd.
Labels: Brown and Rawcliffe, Ltd.; Ormerods, Ltd.
Incubators: Charles Hearson and Co., Ltd.
Rubber Rings: The Poppe Rubber and Tyre Co.
Retorts: John Fraser and Son, Ltd.
Automatic Control: Short and Mason, Ltd.
Cans: John Feaver, Ltd.; Metal Box Co., Ltd.
Airtight Caps: Roberts Capsule Stopper Co., Ltd.
Phœnix Caps: Sure Seal and Sutax, Ltd.
Centrifugals: T. Broadbent and Sons, Ltd.
By-Products Rendering Plant: Towler and Son, Ltd.
Disintegrators: Christy and Norris, Ltd.
Vacuum Seaming Machine: Premier Filterpress Co., Ltd.
Showcard Machines: Masson Seeley and Co., Ltd.

"... one method is to perform closing and vacuumising simultaneously by a vacuum double seamer."

"... the hot material is then passed through the centrifugals, which separate further quantities of fat ..."

THE DEVELOPMENT OF MODERN EVAPORATION . . . . PART TWO

BASIL HEASTIE, M.I.C.E., M.I.Chem.E.

FOR MANY years forced circulation has been provided for certain solutions in which there is a precipitation of crystals. This is particularly true of the salt industry.

Without mechanical circulation there is an accumulation of crystallised salt which forms on the tubes of the evaporator. This quickly reduces the heat transmission and it is necessary to shut down and wash out frequently.

Avoidance of Scale

The use of the mechanical circulator stops the salt formation on the tubes, as the heat is transmitted in a different manner. Without mechanical circulation the level of the brine liquor in the tubes is considerably below the upper tube plate, in some cases 25 per cent. of the height of the tube. With mechanical circulation, however, the level of liquor is carried perhaps 2 ft. above the upper tube plate and so boiling occurs in the tubes. The liquor is superheated and allowed to flash into vapour as it reaches the boiling surface. Since the solubility of most salts is greater in hot solutions than in cold, there will be no crystallisation of salt on the tubes.

Where considerable calcium and magnesium, carbonates and sulphates are present in the solution, scale may accumulate on the tubes, but if the circulation is sufficiently rapid, even this scale will not form, and the tubes remain relatively clean. For evaporating the effluent from electrolytic cells in the manufacture of caustic soda an evaporator has been developed in America in which the liquid is passed through the tubes at velocities of 8 to 10 ft. per second, in which, due to the scouring action, no salt whatever is deposited on the tubes.

Caustic soda has also been concentrated in this type up to 90 per cent. NaOH, using diphenyl as the heating medium. In one test where the caustic was concentrated to 80 per cent. NaOH, with a velocity of 7 ft. per second through the tubes, an overall heat transmission of 250 B.T.U. per sq. ft. hour 1° F. was obtained. The writer obtained values of 350 to 380 when concentrating a calcium chloride solution, 1·4 sp. gr. in a forced-circulation evaporator employing steam at 50 lb. per sq. in., and a velocity of 5 ft. per second through the tubes.

Internal Circulation

In some types the evaporator is virtually a calandria pan provided with an internal circulator, which maintains a rapid circulation up the outer tubes, returning either through a large central tube or through a number of tubes. The advantage of the latter arrangement is that more heating surface is obtained, also heating is done during the descent of the liquor. This type is illustrated

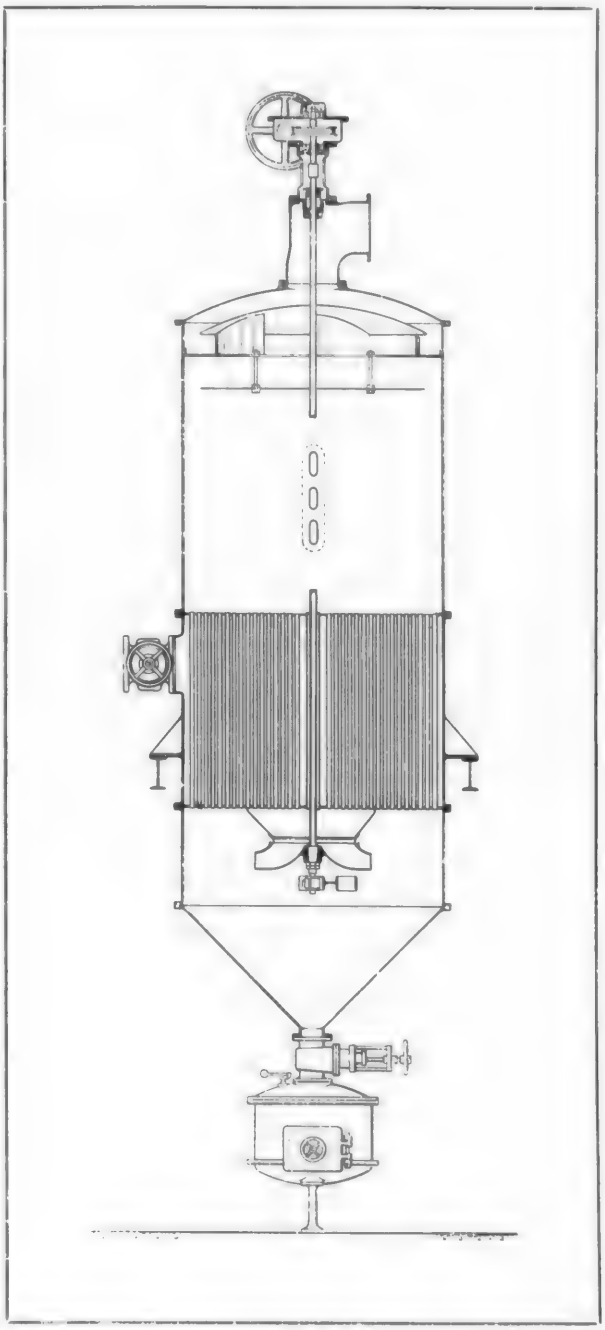
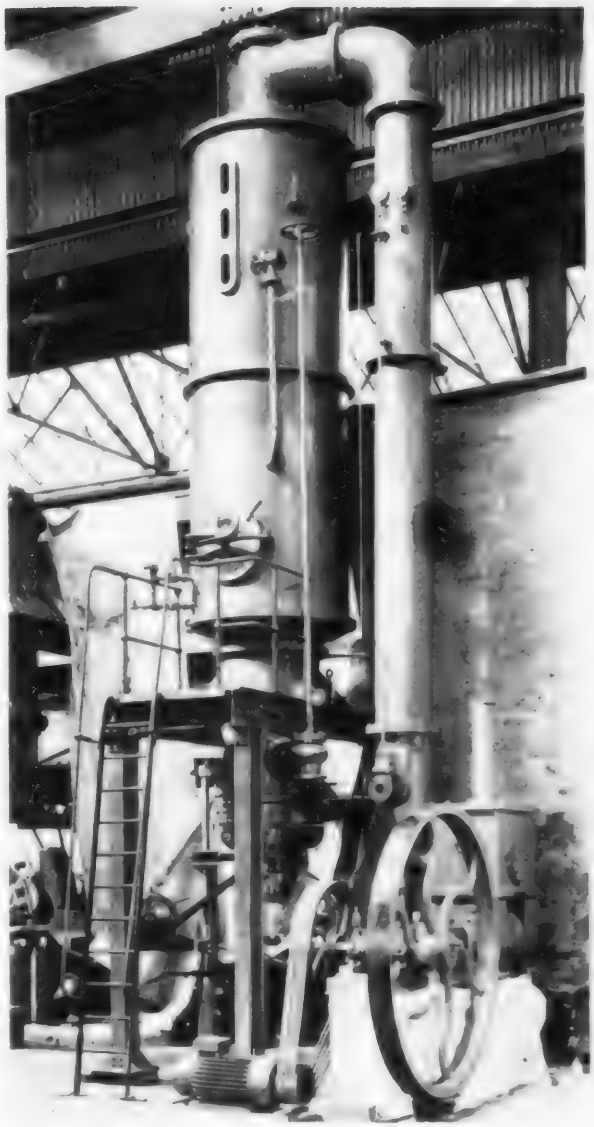


Fig. 1.—A Scott forced circulation evaporator.

Fig. 2.—To the right is shown an evaporator, by Geo. Scott and Sons, Ltd., which works in single effect, in which the circulator is fitted to the bottom of the evaporating vessel.



in Fig. 1. Provision for cleaning is furnished by a hinged, or swing type, bottom, which can be opened for access to the impellor and tubes. In the latest design the circulator is under-driven.

In order to obtain the maximum benefit of forced circulation it is essential that the impellor, or circulator, should be carefully designed, taking into account liquor temperature, viscosity, etc., in order to ensure a high liquor velocity through the tubes. Some designs fail to achieve a velocity in the region of turbulent flow, which is desirable for high heat transfer.

Fig. 2 shows a type working in single effect in which the circulator is fitted to the bottom of the evaporating vessel, or "flash chamber"; such evaporators are used for the concentration of milk and milk products. It will be seen that the circulator is attached by a hinge to the bottom of the evaporating vessel and can thus be readily cleaned. The end covers of the calandrias are similarly fitted, which ensures total elimination of all lodgement points for possible contamination. This type is claimed by the makers to be particularly suitable for liquids which become viscous during concentration; also where, due to corrosion, expensive metals—*e.g.*, nickel, silver, stainless steel—must be used, as undoubtedly the highest heat transfer per unit surface is obtained with forced circulation.

Thermo-Compression System

In this system the vapour from the liquid is compressed, either by high-pressure steam in an ejector or by a mechanical compressor (turbo-blower).

In order for heat to be transferred from a steam to a liquid it is necessary to maintain a temperature difference between them.

Many years ago, Lord Kelvin put forward a suggestion for the production of heat in order to make it available for heating. In a heat engine we take in heat at the temperature T and give out a less quantity of heat h at t, converting only a small portion w, $= H - h$ or $H\frac{T-t}{T}$, into work; so in a reversed heat engine we might take in h at a lower temperature t, do work w, and deliver the larger amount of heat $h + w$ or $\frac{w \times T}{T-t}$ at a higher temperature.

This is the underlying principle of the thermo-compression system; where the vapour is compressed and raised in temperature sufficiently to give the necessary heat drop to the liquid, the simplest method is to compress with high-pressure steam.

From figures published some years ago on the performance of thermo-compressor nozzles, vapour at a temperature of 100° C., 1 lb. of actuating steam at 210 lbs. gauge compressed 0·62 lb. of vapour, delivering 1·62 lbs. of mixed steam at 120° C.; thus 1 lb. of operating steam would evaporate 1·62 lbs. of water and provide 0·62 lb. excess steam, which would be available for heating.

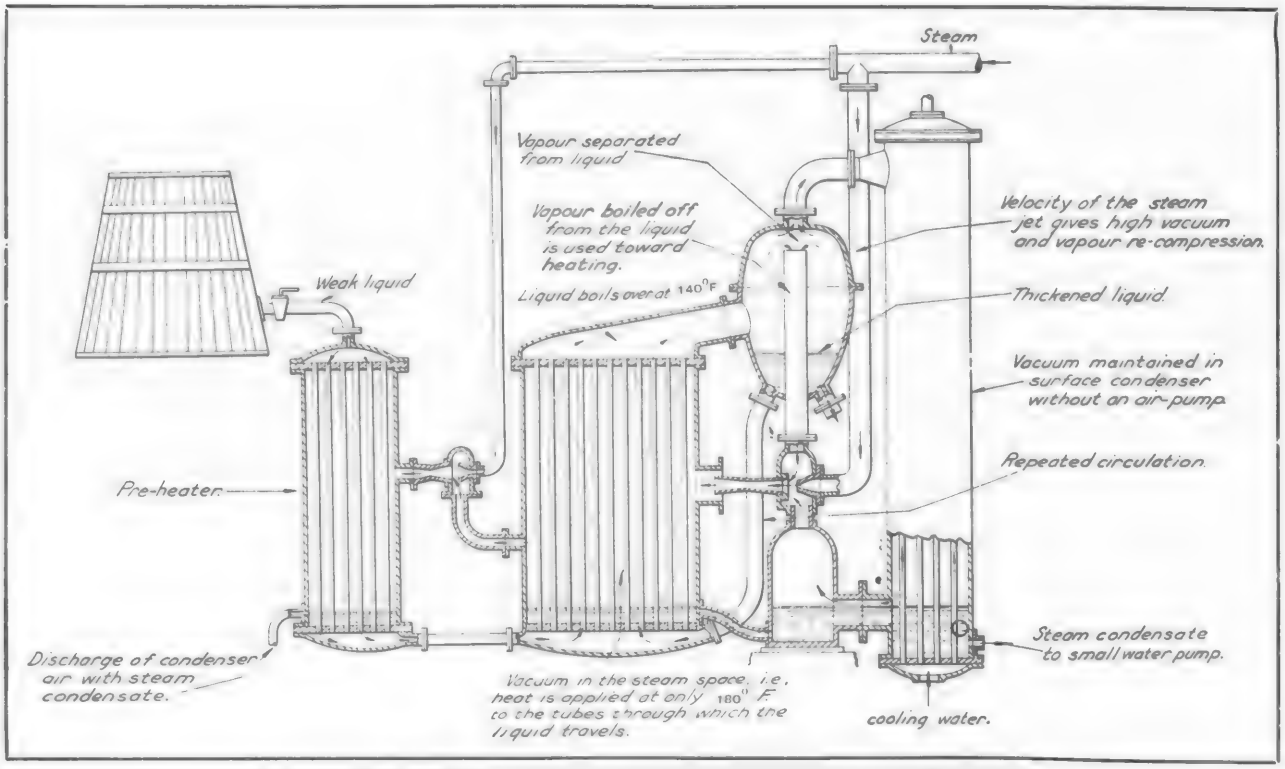
On the other hand, by working with a drop of only 4° C. the entrainment ratio is increased to 3·75, or 1 lb. of actuating steam at 210 lbs. per sq. in. will compress 3·75 lbs. of vapour at 100° C. and raise its temperature to 104° C.

Thus 1 lb. of high-pressure steam will evaporate 4·75 lbs. water and provide 3·75 lbs. of excess vapour, which would be available for heating, or further evaporation in a succeeding effect.

Advantages and Disadvantages

This system is excellent for non-scaling liquids, but, owing to the small temperature drop which is necessary, if the advantage of steam economy is to be retained, any deposit of scale on the tubes must be prevented, otherwise the evaporation falls, due to the lowered temperature drop.

Owing to the small temperature differences necessary in this system compared to the ordinary single-effect evaporator, the surface is much larger for a given out-


Steam
Vapour separated from liquid
Vapour boiled off from the liquid is used toward heating.
Velocity of the steam jet gives high vacuum and vapour re-compression.
Weak liquid
Liquid boils over at 140°F
Thickened liquid
Vacuum maintained in surface condenser without an air-pump
Repeated circulation
Pre-heater
Steam condensate to small water pump.
Discharge of condenser air with steam condensate.
Vacuum in the steam space, i.e., heat is applied at only 180° F. to the tubes through which the liquid travels.
cooling water.

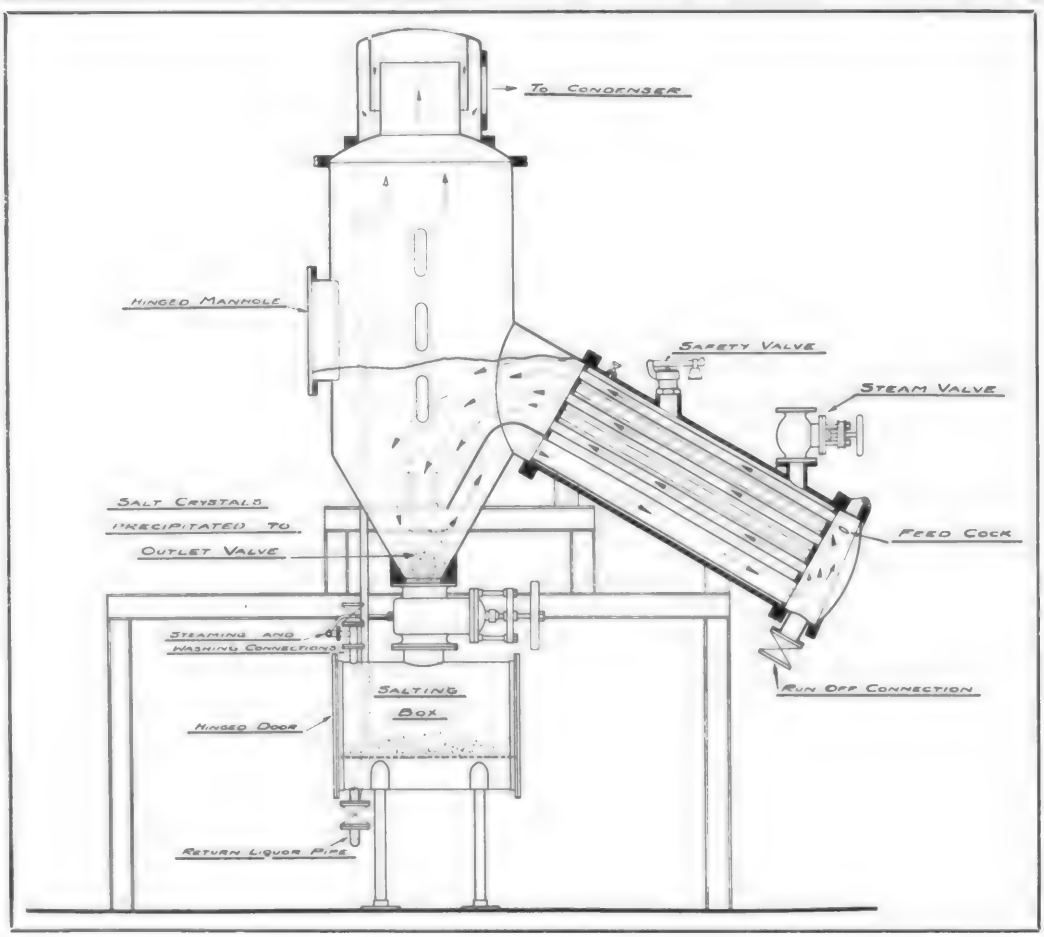


Fig. 3. — Above is shown a descriptive scheme of the vapour recompressing method. Here the weak liquid is preheated by the excess vapour from the calandria which is recompressed. F. Jahn and Co.

Fig. 4. — Left is shown the plan of an evaporator of the inclined tube type fitted with a thermo compressor, by Bennett, Sons and Shears, Ltd.

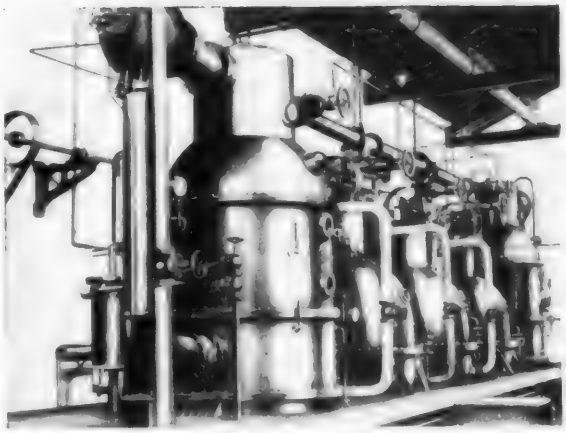


Fig. 5 (Above).—Two evaporators with thermo-compression and three calandrias for final concentration of tomato juice, by Lurgi.

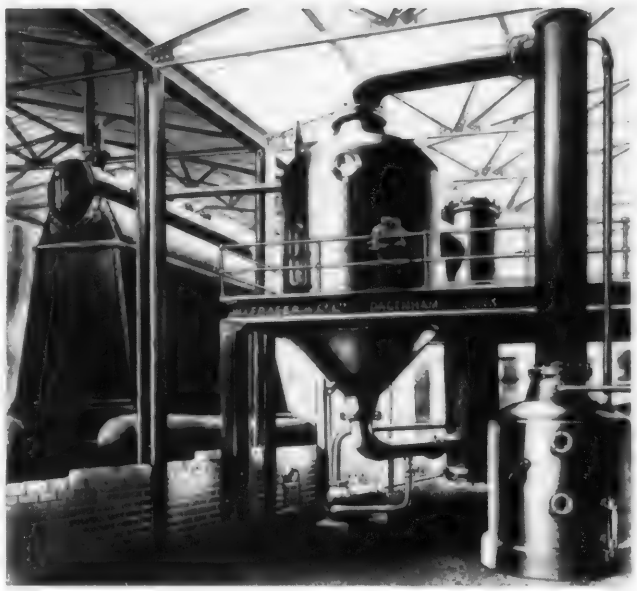


Fig. 6 (Right).—A type of evaporator now being developed for high-boiling liquids, by W. J. Fraser and Co., Ltd.

put, thus the thermo-compression evaporator is higher in first cost but has a much lower steam consumption, and also provides excess steam available for heating. This, however, does not apply to an electrically driven vapour compressor.

The thermo-compression system has been employed in conjunction with forced circulation for the production of distilled water for power stations. In order to prevent scaling of the tubes, fine sand is introduced in the water. This is, however, severe on the circulation pumps; excessive wear was prevented by lining them with rubber.

During the past few years a great advance has been made in steam compressor designs, and the figures given above may have been improved upon; even so, this system is quite impracticable for liquids having a high boiling point—*e.g.*, caustic liquors, glycerin—its chief field being water distillation, concentration of gelatin, and such organic liquids as milk and other foodstuffs which have lower boiling points.

The following table gives some indication of the steam consumption at various operating steam pressures.

Assuming a nozzle efficiency of 0·75 *and the absolute entrainment pressure* = 15 *lbs. per sq. in.*

State of high-pressure steam, saturated.

State of entrained vapour, saturated.

W = *lb. of entrained vapour per lb. of high-pressure steam.*

Absolute Boiler Pressure.	*Absolute Compression Pressure.*		
	20 Lbs. per Sq. In.	*25 Lbs. per Sq. In.*	*30 Lbs. per Sq. In.*
Lbs. per Sq. In.	*Lbs. W.*	*Lb. W.*	*Lb. W.*
100	0·97	0·47	0·26
120	1·06	0·53	0·32
140	1·13	0·59	0·37
160	1·19	0·63	0·4
180	1·25	0·68	0·44
200	1·3	0·72	0·47
220	1·34	0·75	0·5

Results published on vacuum evaporators using thermo-compression jets, for concentrating sugared milk and whey, state that $\frac{2}{3}$ lb. of steam evaporates 1 lb. of water, whilst for double-effect evaporators concentrating gelatin the consumption is $\frac{1}{3}$ lb. steam per 1 lb. water removed.

For some liquids a combination of thermo-compression and forced circulation is very attractive, as the tubes are scoured and scale formation prevented, which is essential when working with such small temperature differences.

Vapour Compression Using Turbo-Blowers

Turbo-blowers are employed where natural power is available; they have higher efficiencies than a nozzle, but will not compress through a wide range, 0·6 to 1 atmosphere being the maximum. At lower compressions their efficiency is from 50 to 65 per cent. (adiabatic compression = 100 per cent.). They have the advantage of not yielding excess steam if they are motor driven.

Tests made on this type showed that 1 kw. hour of electrical energy supplied to the turbo-compressor set, 36 to 37¼ lbs. of water were evaporated from a solution of caustic soda of 7° Baumé, concentrating to 23° Baumé.

This test was made on a plant of 50 kw., which was only partially lagged. The entering solution was at 20° C. and the condensate temperature 80° C.

The makers give the following figures for the evaporation of various liquids:

	Lbs. per Kw. Hour.
Distillation of water	61 to 90
Evaporation of liquids of low boiling point. Sp. Gr. below 1·2 ..	44 to 57
Caustic soda, below 1·5 Sp. Gr. ..	15·4 to 39
Sea water and dilute salt solutions ..	37 to 66

In order for this type to be successful the temperature difference and pressure must be kept within the order of 11° C. and 7½ lbs. per sq. in.

The only field for mechanical compression is where the cost of fuel is very high and electrical or natural power is available at very cheap rates.

(*Continued on page* 28)

PROGRESS IN
1 9 3 8

QUICK-FREEZING MAKES BIG STRIDES

THE PRINCIPLES of quick-freezing are now fairly well known. When animal tissues are seen through a microscope they are made up of minute cells filled with a semi-liquid protein gel. This gel contains a percentage of water in which are dissolved salts of sodium, calcium, potassium and magnesium. Water in which these salts are dissolved does not freeze uniformly in the cells when the product is slowly frozen. Instead, fresh water begins to crystallise out of the cellular and intercellular tissues when the temperature is lowered to about 31° F., and as the temperature is still further lowered, more and more water crystallises as ice, leaving even more concentrated solutions of the various salts.

Now, in the case of slowly frozen fresh products—such as meats, fish and poultry—the proportions of the crystals may grow to many times the size of the individual cells. Such crystals break the tissues, pierce and tear the delicate cell walls, and thereby cause, upon defrosting, excessive leakage, which results in loss of flavour and changes in the physical characteristics of the product.

Structure Breakdown

In freezing experiments it was soon found that all cell structures did not freeze or defrost in the same manner or at the same rate. Animal cells were elastic, while plant cells were inelastic. Even quick-freezing more or less breaks down the structure of plant cells. When fruits and vegetables are slowly frozen, complete precipitation of the colloidal gel results, causing separation of the solids and liquids. Excessive leakage takes place when fruits and vegetables are defrosted, causing them to assume a dry or unnatural flavour.

When fruits and vegetables are quickly frozen, however, instead of a complete precipitation of the colloidal gel, coagulation takes place, which is more or less a stiffening of the semi-liquid contained in the cell, retaining the original flavours and appearances.

Time and Temperature

The problem in quick-freezing is to know what time and what temperature are needed to obtain the greatest number of small crystals in the shortest possible time. In other words, where is the zone of maximum crystal formation?

As early as 1907 the comparative effects upon the product of ordinary sharp freezing and of very much more rapid freezing by conduction were noted by scientists, and a much more comprehensive study along these lines was completed in 1916. Since that time our chemical and biological knowledge of the effects of rapid freezing has advanced to a point where we can now understand its benefits, and the term "quick-freezing" has come to be applied to this accelerated freezing process.

Research Work

Considerable research work has been carried on in determining the percentage temperature curve of crystallisation in freezing food products, developed by Dr. Plank of Germany, who found that between the temperatures of −0·6° to −3·9° C. (31° to 25° F.) approximately 75 per cent. of the total water content is frozen out, and it has therefore been determined as the temperature known as the "zone of maximum crystal formation". Further tests have shown that if products are damaged during freezing, trouble occurs principally in this zone. Consequently the object of any quick-freezing system must be to pass the product through this temperature range so fast that only a minimum of physical and chemical changes occurs. From a commercial standpoint, therefore, we must conclude that these favourable results can only be accomplished by conduction freezing through a method of application that is commercially and economically sound.

Quick-freezing, or conduction freezing as perhaps it should be more properly called, has moved forward to become an important phase in the development and application of refrigeration. In the preservation of a broad range of perishable foods it represents a refinement through the introduction of methods and systems of a more modern type of design for conduction freezing. It is now receiving recognition on this basis, which will carry it forward rapidly and assure its universal application commercially in a field where the older and less modern systems cannot compete.

The Chain

The successful commercial development of this new industry perhaps requires a much broader interpretation of quick-freezing. Satisfactory development is possible only when quick-freezing is dealt with as a complete system of getting perishable foods, with inedible waste eliminated at the point of production, from the producer to the consumer in a uniformly excellent condition by means of low temperature constantly applied. The chain of steps leading from the producer to the consumer involves many intricate problems connected with the raw material, pre-freezing treatment, mechanical handling, packaging, freezing, storage, transportation, marketing and even preparation for the table. Quick-freezing will not make a good product from an inferior raw material, but it must be borne in mind constantly that mere excellence of raw material is not sufficient to ensure a first-class frozen product. Constant study and research are necessary in the selection of raw products best adapted for successful freezing and storing processes, and these detailed studies must be made if unfortunate results are to be avoided.

The Birds Eye Process

This process is well known and is controlled in the U.S.A. by the General Foods Corporation of America. It derives its name from its originator, Clarence Birdseye.

As its name implies, the Multiplate Birds Eye Froster consists of a series of refrigerated plates arranged one above the other in such a manner that they may be moved apart to receive products between them and then closed with any desired degree of evenly distributed pre-determined pressure.

Normally these plates are held apart with an opening between them somewhat greater than the thickness of the package to be frozen, and are raised and lowered by means of a hydraulic system connected to the lower plate. These plates are made of rolled aluminium alloy with sinuous passages through which is circulated the refrigerant, which may be brine, ammonia or another type. These passages are flexibly connected at one end of each plate to a header feeding all the plates with the refrigerant, while the passages at the other end of the plate are flexibly connected to a header which carries the gas to a surge drum located on top of the froster. The surge drum also acts as a receiver of liquid refrigerant, and both headers are connected to it. The plates and connections are enclosed in an insulated box or cabinet with regular freezer doors on all four sides, thus making possible the operation of the equipment at ordinary room temperatures.

In operation, the product to be frozen is loaded between the plates. The hydraulic cylinder is then brought into operation and the first plate with its load is raised until it picks up the second plate with its load, continuing in this manner until all the plates with their loads are raised, thus providing contact on both sides of the product or package under pre-determined pressure and resulting in maximum freezing contact. The cabinet is then closed and the product left in the froster until its temperature reaches about −17·8° C. (0° F.). Relative freezing times for all products of various thicknesses have been determined by thermo-couple tests.

The latest model of the Birds Eye Quick Freezing Machine has contributed much towards economy in freezing because of its compactness and portability. This equipment, being mobile, has made it possible to establish the freezing plants on a portable or temporary basis at the source of supply of seasonal products. Thus is avoided the necessity for large capital expenditure at sources of production in handling and freezing seasonal crops, and the burden of fixed charges on plant and equipment not in use over a large part of the year.

New English Company

Frosted Foods, Ltd., is the name of the company formed in June, 1938, to develop the production of Birds Eye quick-frozen foods in the British Empire. The object of the company is not primarily to go into production in this country, but to supply quick-frosting equipment and to give technical and engineering service to food manufacturers. The first English company to take up the Birds Eye process was Chivers and Sons, Ltd.

The Chairman of the new company is Edward T. Gibson, who is President of Frosted Foods, Inc., in America, the subsidiary of the giant General Foods Corporation, which is responsible for the Birds Eye business. Managing Director is 37-year-old American Robert Ducas, who also heads the British company of Winget, Ltd., makers of concrete-mixing machinery, and is a director of Refrigeration Patents, Ltd. (subsidiary of I.C.I. and manufacturers of dry ice equipment and "Drikold"). Technical American director is Gardner Poole, who is chief executive of Birds Eye Laboratories in the U.S. and who has been associated with quick-frozen foods throughout their development. Famous in refrigerating matters, Gardner Poole is President of the American

Leading Men in the New Quick-Frozen Foods Industry

GARDNER POOLE
Birds Eye.

WALTER S. JOSEPHSON
Haslacher.

S. W. SMEDLEY
Frosta.

M. T. ZAROTSCHENZEFF
"Z" Pack.

Institution of Refrigeration, Vice-President of the American Society of Refrigerating Engineers and President of the Technical Board of the International Institute du Froid.

Quick-Freezing by Immersion

An interesting paper was read at the Food Preservation Conference, University of Tennessee, about three months ago by R. Brooks Taylor (reported in the *Canning Age*) on quick-freezing by immersion.

The principle employed was the freezing of strawberries (one of the fruits experimented with) in a circulating solution of 0° F. Preliminary trials were made with brine, but obviously this could not be used for fruits. It was found that a solution of sucrose was unsatisfactory owing to the fact that even at 10° F. its viscosity was too great. A special sugar solution containing 57 per cent. total solids and made up of approximately 10 per cent. sucrose, 54 per cent. lævulose and 36 per cent. dextrose was found to be satisfactory. This solution has a freezing point below 0° F. and has a low viscosity, approximately 500 centipoises at 5° F. The viscosity is an important point with regard to pumping, and the author finds that the data available on the pumping of oils and viscous fluids apparently did not apply to the pumping of cold sugar solutions.

The immersion system of freezing involves the removal of the solution from the product. This is done by means of a semi-continuous, completely automatic centrifugal which removes practically all of the syrup from the product without damage to either. Approximately 1 per cent. of the syrup is allowed to remain after centrifuging, and this will remain as a coating on the product, thus reducing the possibility of adverse effects of oxidation.

These individually quick-frozen products have their special packaging problems. The shipping cases must be strong enough to support the weight of all those stacked upon it without compressing the cartons. It has been found that 140-point solid fibre containers with a corrugated liner proved satisfactory.

Mr. Smedley's Process

S. W. Smedley, after preliminary experimentation and the production of about 30 tons of quick-frozen peas (*Food Industries Weekly*, April 29, 1938), towards the end of last April and the beginning of May arranged the distribution of his quick-frozen foods by the installation of refrigerated cabinets on the premises of 250 key retailers in an area radiating from London, as far as Liverpool, Birmingham and Oxford. The cabinets were ready by August, so that the 1938 season's pack could be retailed throughout the winter. On November 18, 1938, Mr. Smedley invited the Press to an exhibition of Frosted Foods at the Trocadero, and Mr. Smedley, Jr., explained his process.

"Briefly, English vegetables and fruits are purchased direct from the farmer and delivered to the freezing plants in growing areas. The fruits and vegetables are washed, cut up, shelled or graded, and then placed into various sizes of Cellophane bags. These little bags are then put into a hygienic, waxed box, and this is then subjected to an extremely low temperature. The result is that the produce in the carton is frozen so suddenly that it has not had time to lose any of its freshness, flavour or food value. In fact, all these things are still there in the carton frozen, waiting to be thawed out again. These

PROGRESS IN 1938

TRADE AND

ONE OF the outstanding features of the year in the milling industry has been the phenomenally low prices of wheat. Prices have been lower than they have ever been since the disastrous slump period about 1930, when abnormally low wheat prices heralded a trade slump, which forced us off the gold standard and nearly into bankruptcy. It is to be hoped that the present low wheat prices are not forerunners of another slump.

In December, 1937, English wheat was making 38s. per qr.; in December, 1938, the price was nearer 18s. Other wheat prices have fallen proportionately. Manitobas, which were 64s. per qr. in January, fell to 27s. 6d. in November, and Australians dropped from 42s. to 25s. The official price of straight run flour delivered London has been reduced in corresponding manner from 37s. 6d. per sack to 22s. 6d. per sack. This has meant that very heavy deficiency payments will have to be paid to home farmers to bridge the gap between the average price realised and the guaranteed sum of 45s. per qr. As a result the quota charge on flour has risen from 6d. per sack in January to 6s. in December. This, of course, has prevented the consumer from feeling the benefit of the low prices of wheat.

Anglo-American Trade Agreement

Another factor which will have an influence on wheat prices is the Anglo-American trade agreement whereby the duty on foreign wheat is removed. This does not refer to U.S.A. alone; by the most favoured nation scheme other nations are released and will enjoy the benefits of the abolition of the duty. The only countries who will not be pleased are Canada, Australia and India who were already exempt from duty.

Harvests

Harvests all over the world have been plentiful, which accounts for the low price. Wheats from the Danubian basin have been very abundant, but this has been affected by the wheat bug and the amount that could be safely used in bread-making grists has been small. Large quantities have been ground up for feed cake. Certain influential millers have purchased quanti-

cartons are kept at the factory awaiting delivery by lorries, specially equipped for transport of frozen produce.

Food Cabinets

"The grocer is supplied with a 'Prestcold' food cabinet, which is purchased outright by us and is our property. So far, I can tell you, we have supplied 150 grocers." Thus, frosted foods can now be bought over the counter in England, and there is no doubt that Mr. Smedley has been the first to facilitate this by the provision of the cabinets.

Spray or Fog Freezing

In this method the heat is removed from the food by spraying the product or the package with a refrigerated liquid, as is done by the "Z" method invented by M. T.

RESEARCH IN CEREALS

T. H. Fairbrother, M.Sc., F.I.C.

ties of wheat on behalf of the Government. This is stored at various places, and though the situation is far from being satisfactory in case of war it is certainly much better than it was a year ago.

Research Work

During the year cereal chemists and milling engineers have been busy carrying out researches to improve the methods employed and the yield and quality of the flour obtained. Nothing revolutionary or outstanding has been published since the Review of Cereal Chemistry appeared in FOOD MANUFACTURE in January, 1938, but, nevertheless, a careful perusal of the literature shows that progress is being made, and what were once mere speculations are now consolidated into facts.

Physical Methods

The physical methods for the evaluation of flour strength and baking properties have been employed actively in many directions. One interesting development was published by Malloch in July. Malloch realised the urgent need for a reliable test for baking quality that could be used by plant breeders in the early stages of the development of their new strains of wheat. The quantity of grain available precludes the use of milling and baking tests or of dough-testing machines such as the Brabender, Swanson, Chopin or Buhler. To do this a recording mixer which operates with only seven grams of dry matter has been constructed. This should prove of great value.

Milk in Bread

Research work of great topical interest is that carried out on the addition of milk in some form or other to bread. In these days of nutritional campaigns and surplus milk the idea is alluring. Fairbanks at Illinois published a typical paper on the subject in March, and this contains a fairly exhaustive review of the literature of the subject. He concluded that the addition of milk solids to a water bread formula increased the nutritional value of bread. The nutritive value of bread containing 12 per cent. solids was greater then than of bread containing only 6 per cent. milk solids.

Bran Separation

At least one investigation has been published during the year (Carr, *Cereal Chemistry*, September, 1938) on the time-honoured attempts to remove bran from cereals by chemical means. The method appears rather drastic and is probably impracticable. The grain is first heated with sulphuric acid until the seed coat blackens. Next the mass is nitrated, and at a certain stage the mass is washed with distilled water until the washings are no longer acid. Such investigations may have some theoretical interest, but it must be remembered that bran and middlings are required for animal food, and the miller may be able to obtain at least the cost of his wheat as the price of his offals.

Enzymic Activity

Many researches on enzymic activity have been published. Read and Haas have continued their investigations on the influence of bromate on enzymic activity. Landres and Frey have published a sensitive method for determining proteolytic activity based on viscosity determination. Hills and Bailey have studied amylase activity in germinating barley and work on the relationship between diastatic activity and gassing power has been published. A good deal of attention has been paid to the problems of bread staling, but no satisfactory conclusions have yet been reached.

No Outstanding Discoveries

Looking back, the year 1938 has been more a year of consolidating previous researches than one of outstanding discovery. Undoubtedly the problems of the milling and baking industries are being gradually solved, and one hears with some satisfaction of a move for a research association for the bakery trade. If such an association is set up and works in very close co-operation with the Millers Research Association, some real progress will have been made.

Zarotschenzeff. "Z" Pack quick-freezing employs refrigerant sprays at high velocity, the sprays being in direct contact with the product wherever possible. Products are preferably frozen first and packaged after freezing. Salt brine is used in the sprays for some products, such as poultry and sea foods. Sugar solutions are used for fruits and berries, and neutral solutions, made from sugars and salt, for most vegetables. Products are carried through sprays on a wire-mesh or stainless steel conveyor.

The story of Mr. Zarotschenzeff and the "Z" pack is a long one. Nine years ago he started to develop the quick-freezing process in Paris with the Entrepôt Frigorifique Paris-Vaugirard. In 1930 he came to England and superintended the erection of the first "Z" process plant at Grimsby for Smethurst Brothers, in co-operation with the Liverpool Refrigeration Company, which has, as reported on another page, just recently been taken over by J. and E. Hall, Ltd. For eight years fish fillets have been quick-frozen in one to seven lb. cartons at Grimsby, for distribution to hotels, restaurants, and institutions. Later, "Mr. Z" went to the United States and organised the American "Z" Pack Corporation, of which he is Vice-President.

In the quick-freezing of fruit and vegetables the "Z" Pack Corporation have recently made an important development. They have built a portable, mobile plant capable of an output of 1,000 to 2,000 lb. per hour. This plant can thus operate in Tennessee in April and May, move to New York in June to pack green peas; move to Michigan for the cherry season in July; pack lima beans in August and corn on the cob in September and October. In winter it can be utilised for packing shrimps and fish fillets. Experiments are also being made in quick-freezing sliced pineapples.

In FOOD MANUFACTURE for September, 1938, there was a description by Mr. W. M. Zarotschenzeff, son of "Mr. Z", of frosted foods in Japan.

"Mr. Z", as reported in FOOD MANUFACTURE, November, 1938, has formed a new company in New York, known as National Frosted Foods, Inc., the new company being essentially a distributing organisation. It will contract directly with producers, and will distribute their frozen foods under the packer's brand name, or under its own name. "Mr. Z" visited this country early in 1938, and his new organisation envisages the development of important exporting business for Europe.

Frozen Peas

Pioneers in the frozen vegetable field in this country were W. Bailey, Ltd., of Covent Garden, who have produced and supplied frozen peas to hotels and restaurants since 1932. Their products are marketed under the trade name of "Fropax".

The Haslacher Process

This was described in *Food Industries Weekly*, February 18, 1938, by Mr. Walter S. Josephson, who was founder and former president of the Dry Ice Corporation of America. He came to this country from the United States a few years ago, and formed Carbo-Ice Industries, Ltd., makers of "dry ice". He is technical director of Garden Fresh Foods, Ltd., and the two factories are on the Treforest Estates.

Mr. Josephson described the process as follows: "The fresh fruit or vegetable is brought straight from the field and is then washed and prepared for packing. Close inspection and sorting are given and the best cannery practice is followed." It should be pointed out here that though the subsequent freezing process is sufficient to render the produce sterile, extra precaution is taken at this early stage when the products are submitted to a secret sterilisation process. Vegetables are also blanched by a patented method. "Following this careful preparation", said Mr. Josephson, quoting from Professor Haslacher's description, "the food material is packed into its container".

Waxed Containers

"The American company at the moment is using waxed paper containers, but there is no restriction upon the material used. The contents are then covered with liquid —syrup (sucrose and water) for fruits and berries, and ordinary water for vegetables. A depressor, which is a flanged disc of cardboard, is then applied, and the food material is gently submerged beneath the liquid.

"The functions of the depressor are dual. First, to hold submerged the food material beneath the liquid while it is being frozen and, second, to ensure a more solid pack. The depressor is perforated so as to enable the liquid upon freezing to expand into the head room or space between the depressor and the lid of the container, thereby preventing breakage. Thus the depressor provides an encasement of ice on top, bottom and sides of the food, thereby obviating air contact. The containers now filled and lidded are ready to be frozen.

Brine Tank

"The Haslacher process employs a brine tank, similar to that used in the manufacture of commercial ice, the chilled brine being circulated by agitators. A good transfer of heat is provided, and, because of the efficiency of this manner of freezing, temperatures of reasonable degree are employed. Freezing can be performed at a temperature of 10° F."

The Freezing Units

The freezing units are described as follows:

To a head, a plate of sheet metal the length and width of which equal the open top of the standard can used in ice manufacture, is attached a number of cylinders, each open at the top and closed at the bottom and each uniformly slightly larger than the actual containers of food. These cylinders act as sleeves to protect the containers from the brine; at the same time the walls of the cylinders conduct the heat from the containers to the chilled brine. Each of the cylinders is now filled with the containers and the entire unit, which is mounted on a monorail, is thereupon sent into position in the brine tank, running by gravity to its place over a system of switches.

(*Continued on page* 32)

PROGRESS IN
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CREATIVE DEVELOPMENT IN THE CHOCOLATE TRADE

"Cortes" reviews the past year

TO REVIEW the trends of development within the chocolate trade during the past twelve months is a task to which there appears to be no beginning and no end.

However, after casting back my mind to recollect what we, within the trade, were doing this time last year, looking around to take stock of our present activities, and remembering those projects which have been both started and dropped during the period, I have been able to form a personal impression, at least, of recent development.

Fighting Bad Trade

Trading conditions have been very difficult, and the truth of the *cliché* "Necessity is the Mother of Invention" has been proved time and time again. As is usual in times of bad trade, manufacturers—and, of course, I am generalising here—spare no effort in their attempts to "tickle the public's palate."

In order to coax the coppers from the consumers' pockets, to divert sales from competitors' products, or to convert buyers of other pleasures to purchasers of chocolates, manufacturers are compelled to be progressive, creative and combative. Not only has competition, both within the trade and from alternative opportunities of spending, been keener than ever, but manufacturing costs have operated against the chocolate manufacturer. It has been a matter of fighting for turnover and for profit margin. When one realises that, normally, these two factors are diametrically opposed and require drastically different treatment, it is fairly simple to appreciate the enormous task which all manufacturers have had to face up to during the past year.

Count Lines

The trade in "Count Lines" has continued to grow. It is difficult to estimate, with any degree of accuracy, whether there has been any increase in the total tonnage of bars, cakes and blocks, but certainly the number of varieties available has grown during the period. This type of business seems to thrive on bad trading conditions.

The consumer, of apparent average means, would hesitate to ask his retailer for two- or three-pennyworth of loose chocolates, whereas he does not consider it belittling to his dignity to ask for a two-penny count line or bar of chocolate. On such psychological facts has this type of trade been cultivated. Among the newcomers to this market there has been only one line which has risen to the front rank during the year; many lines have both come and gone during the time, and one or two of last year's "big sellers" have almost disappeared from the counters.

Whilst dealing with count lines, let us consider them, for a moment, from a creative point of view.

What are the basic and essential requirements in a count line of popular appeal? Value for money? That should go without saying. An appearance of "good size"? Size, without weight, is useless, as the failure of all marshmallow goods (on the English market) has demonstrated over and over again. Other essentials are chewing quality—or at least some quality which ensures an adequate "eating life". A "more-ish" flavour and —last, but by no means least—an attractive wrapper, display carton, showcard and advertisement.

There are many ways of producing a line which would measure up to these standards and yet fail to be a "winner". It requires the touch of genius—sometimes this is supplied by arrangement or hard work, but, usually by sheer good fortune—to convert just an ordinary line into a product which will—for a time at least—sweep the market.

Photograph, courtesy Rowntree and Co., Ltd.

Machinery

Automatic moulding plants, shell moulding plants, wrapping machines and other aids, from the hand and brain of the engineer, have become available for the mass production of Count lines. In order to give adequate value, the manufacturer is compelled to reduce manual operations to a minimum, to eliminate labour charges and, by the same rule, he must be ensured of a definite and regular turnover so as to keep his plant working to capacity. Bearing in mind the narrowness of the margin between a successful line and a failure, the crowded state of the market, the considerable outlay on specialised plant and the necessity for national distribution, it is small wonder that one cannot report any outstanding development in this particular branch of the trade.

Adopt, Adapt and Improve

I believe it was the Duke of Windsor (when he was the Prince of Wales) who first used the phrase, "To adopt, adapt and improve". Whoever created the slogan, it is certainly the chocolate trade who have made it their own line of policy. During the year, particularly, the outstanding successes in boxed chocolates (*i.e.*, branded assortments packed in weigh-out boxes) have been those based on ideas culled from other trades. As two widely diverse examples I would mention the line of which every unit is given the appearance of a popular "novel" and the one which, by its wrappers, general "get-up" and tin container has every appearance of a toffee assortment. One might draw up a very long list of present-day lines, all inspired by successes in other spheres, without exhausting the source of supply.

From a development point of view, one has to acknowledge the genius behind such moves, but, and no doubt this has been a contributory factor, almost all these creations have been produced so that they could be manufactured on existing types of plant. In some instances it may have been necessary to purchase new metal moulds, but, generally, wrappers, foils, labels and containers have been the only causes of outlay—the only source of potential loss in the event of the failure of the lines.

Simplicity of Package

During the year the general public have been taught, *vide* the national advertisements of the leading chocolate houses, the disadvantages of purchasing chocolates in fancy packings, the expense of tinfoils and decorations, and their attention has been focussed on the certainty of obtaining better value for money when simple products in the barest necessities of packages are bought. This has been capitalised by many manufacturers, especially the smaller concerns to whom the manufacture of any other type of product is impossible.

There has been a wave of interest in the so-called "freshly made chocolate" trade. Competition has made it necessary for new, interesting centres to be included in the varieties available—by those manufacturers who have gone out for this class of trade. Quality, in the main, has been definitely on the up-grade. At the same time, whilst "freshly made chocolates" are, of necessity, manufactured by hand methods and cannot, therefore, except to the very smallest manufacturers, constitute either a source of much turnover or great profit, the idea has proved amenable to development along a slightly different line of attack. These same interesting centres, machine-coated and packed in plain boxes of the cheapest possible kind, have been marketed to meet a demand for good quality chocolates at minimum cost. This is a trade for which there is a large opening, so that both turnover and profit can be won from it.

Eye, Purse and Palate

One might summarise development, so far as the chocolate trade is concerned, by a statement that the consuming public are now being attacked from two totally different angles—one using an approach primarily appealing to the eye and the second appealing to the purse and palate.

From the viewpoint of the practical chocolatier, this year has been as difficult as ever—and much less interesting than usual. No fundamentally new machines have been introduced, no new processes come to light, no new materials discovered. Any new plants which have been offered have, as their *raison d'être*, the making of economies in production costs, the giving of greater output with less manual labour, or the superseding of manual work.

No Inventions!

The chocolatier has, therefore, not been assisted by abnormally clever inventions. His task, during the year, has been to make lines of popular appeal at the lowest possible cost and, to this end, his efforts have had adequate support. Possibly the days of drastic changes have gone. After all, there are precious few operations for which we have not, already, a choice of tremendously efficient machines, and during the last decade the economic outputs attainable from most types of plant have been increased out of all knowledge, whilst operation costs (both labour and power) have been reduced to unthought-of minima.

The Future?

I feel that one might be excused a glimpse into the future—so much depends upon factors right outside our control. One can visualise, however, a time—how far distant I would hesitate to guess—when every house will specialise in one type of product only. Such a development is not so devastating as might appear at first glance.

From the earliest days it has been a truism that the originator of a line always enjoys the bulk of the business (in that line) in spite of all competition and any price cutting. With each and every manufacturer supplying the requirements of its own particular market and with healthy competition furnished by growing "copyists", development will be along more gradual (and less wasteful) lines. There is, of course, always the possibility of a revolutionary process being invented, or an unheard-of new material being introduced, but, day by day, the fact that "there is nothing new under the sun" is becoming more and more factual. I believe that most of the products which are claimed to be "something new" can, on investigation, be shown to be something quite old—in a modern dress.

THE NEW FOOD AND DRUGS ACT

A CRITICAL EXAMINATION BY H. R. JENSEN, M.Sc., F.I.C.

THE CONSOLIDATION of the various acts relating to foods, drugs, markets, etc., with amendments known as the Food and Drugs Act, 1938, does not come into force until October 1, 1939. This long period of grace is no doubt due mainly to stringent requirements embodied as to premises, storage, and distribution, for which preparation may be needed.

Following the general review to be given of the principles involved in pure food administration will be found a summary of those sections of the new act of particular interest to food chemists. Those who have had experience in the last twenty-five years of the many illogical and anomalous legal rulings as to food products have long waited for guidance in their doubts as to what is or is not permissible.

Descriptions Required

Analysts who have been pressing zealously for appropriate descriptions and compositions for various products will also have expected some specific support. Again, the interests of the consumer, since all are consumers, certainly ought to be made definite to the utmost extent. Lastly, a more rational legal procedure, when infringements are alleged, might avoid injustices to distributors and manufacturers. In all these directions, however, it would appear that this act will disappoint when judged by previous experience.

The most definite impression resulting from a close reading of the eighty-five pages of somewhat involved regulations is the reiteration of authority to order composition, description, storage and distribution as may be laid down at any time. One might have expected to find numerous references to actual ingredients, impurities, contamination, additions, deletions, adulterants and process factors—in fact, to have the most complete statement of standards or limits in all possible directions. All such mention, however, is entirely excluded, with perhaps such strange exceptions as the limit figure for water in "diluted spirits" (35 U/P).

Wide Generalisations

Of course, most contingencies are provided for in language by sweeping, all-embracing generalisations. Such phraseology as "The Minister of Health may make regulations for all or any of the purposes mentioned . . ." is the familiar and effective bureaucratic device. It must be admitted that the defining and control of food purity, composition and distribution is scarcely a field for democracy, since well-informed and authoritative rules are required "continuously".

Nevertheless, as in the past, it may be expecting too much from a ministry, constituted as we know it, to use wisely, for example, power to prohibit what may be correct or to permit what ought not to be—or what vested interests may desire. Especially does this apply when one considers the probable departmental delay in learning of practices, processes, and manipulation.

Unlimited Powers

The unlimited powers conferred by this Act are well shown in Section 8 (q.v.), where all products are covered under every contingency even where such is not separately provided for. Alternatively, in these matters of vital importance to all, it does not seem proper to maintain existing procedure. This allows in many cases a decision as to food purity, etc., by individual and minor courts, either by opinion, precedent, and as each court prefers. This objection applies to a number of questions.

Metallic Impurities

Adjudication as to the practical non-injurious limits of such contaminations as arsenic, lead, copper, zinc, tin, etc., where it will be agreed that physiological activity or harmless dosage will often not be determined by adopting single limits of content regardless even of amounts of contaminated products consumed. Fair adjudication or indeed any adjudication becomes still more unlikely when dealing with other difficult questions.

Control of Processes

What regulation may be required of edible fat hydrogenation and processing; of water chlorination and sterilisation; of flour fractionation, improving, bleaching, etc.?

What control should be applied to the use of emulsifiers, baking powders, fumigations, artificial flavourings, frothing agents, alkalisations, desiccations, refrigerations, and many commercial scientific devices?

What limits of composition might be enforced for such widely consumed products as chocolate and cocoa, cakes and cream confections, jams, wines, and beers? Finally, what control is advisable in the broadcasting of accessory ingredients such as vitamins and possibly hormones, which are outside existing systems?

Chemical Treatment

In view of the large and increasing application of chemical changes to various essential food products in

everyday consumption, some of us have serious doubts as to possible risks and ultimate consequences. Such questions are obviously too technical and complicated to be correctly decided by a purely legal tribunal. Moreover, experience suggests that wrong decisions or indefinite postponements may not be infrequent by government departments. No one yet appears to have seriously disputed the rational request put forward many years ago by responsible food technologists.

Board of Reference

This was for the formation of a "Board of Reference" fully representative as to science and industry, law and administration, such board to be fully competent to draw up and give specific rulings on these matters, and to advise where instances beyond anticipation occur. Such body might often give full protection to the public by acting prior to unnecessary prosecutions, and give authoritative guidance in advance as to what is permissible or prohibitive in respect of composition, description, purity, and adulteration. Principles of this kind have been used successfully elsewhere.

The highly unsatisfactory state of the vital science of human nutrition, as well as its rapid changes, surely makes it necessary to break away from all previous methods of administering acts governing the manufacture and supply of food products? It is to be hoped at least that we shall not be told that ministers already receive, and act (?) on all the expert advice necessary in questions of food "purity" and nature, which advice in any case may remain anonymous.

Hygienic Rules

To conclude on a more hopeful theme, undoubtedly the great progress foreshadowed in the Act is the increased power for controlling the hygienic handling, storing, distributing, and "preparing" of foods. Although there is no specific mention, it will certainly be desired that the control and inspection granted under Section 13 (h) shall be actively applied whenever necessary to ensure that the best conditions as to wholesomeness and cleanliness apply in the kitchens of restaurants, cafés, and hotels.

SUMMARY OF SECTIONS DEFINING COMPOSITIONS, PURITY, Etc.

Section 1.—No person shall *add* direct or permit any other person to add any substance, either to render food injurious, or to so affect the quality or potency of drugs. Even possession of such product for purposes of sale is an offence. Declaration of such an addition also is not a defence.

Section 2 applies similarly to abstractions of any constituent. Here, however, such abstraction is permissible if the purchaser is notified, unless under possible regulations a specified composition is being contravened. (N.B.—The position in case of destruction of a constituent appears to be vague.)

Section 3 restates the established basis of food and drug sales: "If such are to the prejudice of the purchaser—*i.e.*, if any food or drug is not of the nature, substance, or quality demanded by the purchaser" . . . this constitutes an offence. The onus of proof, where the purchaser may have demanded something different from that defined (?) under the Act or regulation, is placed on the seller.

Section 4.—In respect of "additions" and "abstractions" it is permissible for a defendant to prove that such are not injurious (or affecting drug potency, etc.); are necessary for commercial preparation; and that a specified and explicit label declaration is made (with certain exceptions for pre-1893 labels, and 1932). Similarly only extraneous matters "proved" unavoidable in collection, etc., are permissible. Defences under these headings are only valid where any relevant provision in any (future) regulation is not infringed.

Section 6 stiffens up the requirements of fair advertising, since the onus of proof of any misleading statement by label, wrapper, or advertisement is now put on the seller or publisher. These will now be required to prove ignorance and inability to ascertain with reasonable diligence.

Section 7.—In the event of regulations being drawn specifying particular additions and amounts to foods—such additions within those limits will be "deemed" not to render the food injurious to health. (Perhaps an indemnity in advance if mistakes are made—but not for the consumer.)

Section 8 illustrates completely the powers which the Minister of Health will be able to apply at any time. The Minister may make regulations for all or any of the following purposes:

> Prevention of danger to health from importation, transport, storage, exposure, and delivery of human food for sale.
>
> Labelling of containers.
>
> Prohibiting or restricting the addition of "any substance" to, and "regulating" generally the composition of any food (except bread and flour controlled by Section 30).

The only qualification of these powers is: "If they are, in the opinion of the Minister, necessary or expedient for preventing danger to health, loss of nutritional value or otherwise for protecting purchasers." All of which may leave scope for an arbitrary exercise of power.

Dairy Product Sections

Section 20 gives power to make regulations prohibiting or restricting the addition of any substance, or the abstraction of fat or other substance "in the absence of express provision in the Act".

Section 23.—Regulations may be made determining what deficiency in any of the constituents or what proportion of water shall, in the absence of contrary proof, be assigned as correct for genuine milk. These regulations, however, must be laid before Parliament (the exceptional cow, evidently, is still to remain outside control, with the onus of proof on the seller).

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A NEW FORM OF CANE SUGAR

S. Henry Kahn

A NEW method for the preparation of sugar whereby the sugar retains all the qualities of fresh cane juice, and notably all the vitamin content of the sugar cane, has been perfected in France and is being used for the preparation of what is called Neo Sucre. Certain portions of the process are being kept secret, but it is possible to reveal the general lines of manufacture and to give some idea of how the new sugar is obtained.

The sugar is made entirely from cane juice, which is first stabilised to prevent fermentation. Although this part of the process is kept secret, the inventor of the method, M. Arnold Reymond, insists that it in no way affects the vitamins contained in the juice. After this treatment the juice is ready to be turned into sugar without danger of fermentation trouble.

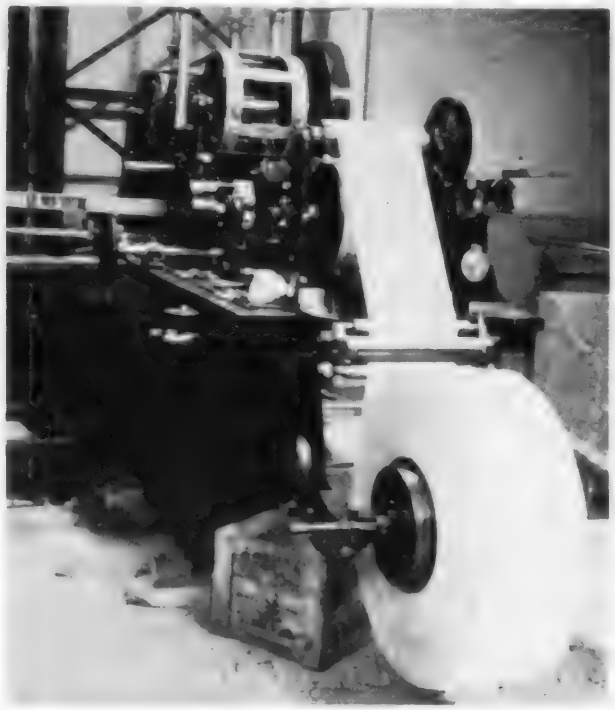
The juice is first evaporated to crystallisation point. In doing this it is important that the juice should not be heated to a temperature which will cause the breaking down of the vitamins or other biochemical constituents of the juice. Here also the greatest secrecy is observed as to the details. The machine used for the purpose, however, is a sort of atomiser, from which the sugar comes in a very moist state in the form of fine crystals.

This damp crystalline sugar is of a very pale tan colour, dissolving easily and having a flavour closely resembling ordinary sugar. One can detect, however, a very slight trace of the taste generally associated with brown sugar.

The loose crystals coming from the dryer are then sent to a moulding machine in which they are pressed into blocks of the desired size. The machines used for this purpose have a capacity of about 5,000 blocks per hour, each block weighing about half a pound. The blocks come from the machine on trays which are carried to the dryers by an endless chain.

The dryers are specially designed to protect the vitamins of the sugar against all danger of injury. The atmosphere in the dryer is inert, all the oxygen being removed from the air used. Moreover, the temperature is never allowed to go above 54° C. In this dryer the blocks of sugar dry out in about 3½ hours and are then ready for breaking up and packing.

After the sugar comes from the dryers (left) it is broken up and packed by this machine (below).



The sugar coming from the dryer is placed directly into the packing machine. This breaks the blocks up into regular lumps, weighs out the lumps and packs them in paper without any need for moving them from one machine to another, the whole being done in one operation.

These packages then go by a belt conveyor to the packaging table where the paper packed sugar is placed in boxes for the larger sizes or wrapped in Cellophane for the smaller ones.

For this sugar it is claimed that it has exactly the same chemical content as to elements of calorific value, nutritive value and vitamins as cane juice. Several interesting experiments have been carried out with it by French doctors to determine its reaction in the human body, especially as compared with ordinary refined sugar.

Dr. Henri David, using three subjects in good health, fed them 100 grammes of refined sugar on an empty stomach in the morning. This resulted in varying degrees of glycosuria in all three cases. After a rest of two weeks, the same subjects were given an equal dose of the "neo sucre" without producing glycosuria. A similar experiment was carried out on six athletes during the Paris-Strasbourg walking race. These men were given up to 300 grammes per day of "neo sucre" without any ill effects, the tests having been carried out by Dr. Corbier, doctor of the Union Française de Marche, organisers of the race.

WHY NEGLECT POPPY SEEDS——

for Bakery and Confectionery?

H. STANLEY REDGROVE, B.Sc., F.I.C. (Author of *Spices and Condiments*), urges greater use of the poppy seed and gives some interesting facts to support his contention.

"OF THE cultivated poppy", writes Pliny in his famous *Natural History*, "there are three kinds, the first being the white poppy, the seed of which, parched, and mixed with honey, used to be served up in the second course at the tables of the ancients; at the present day, too, the country people sprinkle it on the upper crust of their bread, making it adhere by means of the yolk of eggs, the under crust being seasoned with parsley and gith to heighten the flavour of the flour."

The use of the seeds of the Opium Poppy (*Papaver somniferum L.*) as food is certainly extremely ancient. Seed capsules of the plant or of a closely related species have been found in the Lake Dwellings of Switzerland. Pliny's remarks, however, suggest that poppy seeds had fallen out of favour with the fashionable Romans of his day. It is as difficult to understand the reason, as it is to understand why the seeds, which are so inexpensive, are almost entirely neglected by British bakers and confectioners to-day.

It is true that occasionally one may come across "seed twists" in London restaurants and in the shops of London bakers, but this form of bread seems much more popular in New York, so far as I am able to judge from a single visit. At any rate, while there I was able to obtain rolls with poppy seeds on their upper crusts every day for breakfast, and found them to have a specially attractive flavour when eaten either with butter or marmalade.

No Opium in the Seeds

Is it possible that the present-day neglect of poppy seeds in Great Britain is due to the fact that they are the seeds of the *opium* poppy? It should be borne in mind that the opium poppy only develops an appreciable content of narcotic alkaloids when it is grown in a hot climate, and, in any case, there is no opium in the seeds. The seeds not only have an agreeable nutty flavour, but are decidedly nutritious owing to their high content (44 to 50 per cent. or more) of a bland, fixed oil, which can be (and, indeed, in some parts of the world is) employed as a salad oil.

The seeds are produced by the plant in great abundance. They are shaped like little kidneys, about 1 mm. long, and, if examined by the aid of a good lens, are seen to be covered with a raised network of fine lines.

The colour varies according to the colour of the petals. In India, a distinction is drawn between blue (or slate-coloured) seed, red seed and white seed. The first is that used by the few bakers in this country who make "seed twists". But it is so little esteemed that, under the name of "maw seed", the bulk of the seed coming to this country is sold as a food for cage birds.

I have no wish to deprive any poor bird in captivity of an admirable diet; but I do think we might make more and better use of a foodstuff which combines the virtues of high nutritive value with high palatability.

In India, the food value of the seeds is properly appreciated; and in Eastern Europe, too, better use of them is made than is the case with us.

Poppy Seeds in Confectionery

Czecho-Slovakia is famous for a confection consisting of pastry filled with a mixture of poppy seeds and honey. Some years ago I had samples sent to me by air from Prague in order that I might taste them while still quite fresh. I found them very delicious, the nutty flavour of the seeds blending admirably with the sweetness and aroma of the honey. Here, certainly, is a type of pastry which could very easily be made by British confectioners. New cakes and pastries are always welcomed by the section of the British public which has a sweet tooth, and I have no doubt that a filling of poppy seeds and honey would find a ready market. If, of course, it was thought that the word "poppy" has an alarming sound, the confections could be sold under another name.

Care is necessary to ensure the purity of the seeds. In the case of shipments to the United States, the presence of the very poisonous seeds of henbane has been reported.

Regarding the oil, according to an examination by Eibner and Wibelitz, the fatty acids (present as glycerides) are: oleic acid, 28·3 per cent.; *alpha*-linoleic acid, 29·5 per cent.; *beta*-linoleic acid, 29 per cent.; saturated acids, 7·2 per cent. There is a certain amount of evidence for regarding unsaturated acids, such as linoleic acid, as desirable items of diet; and, if this view is accepted, it provides a further reason for the wider employment in the food industry of poppy seeds and their oil.

LEARNED SOCIETIES DINE AND DANCE

How Fourteen Celebrated at the end of 1938

A COMPANY representing a hundred and one interests sat down to dinner at the Connaught Rooms, Great Queen Street, on the occasion of the Annual Chemical Dinner on November 22 under the auspices of the following bodies:

The Chemical Society, the Institute of Chemistry, the Society of Chemical Industry, the Society of Dyers and Colourists, the Society of Public Analysts, the Faraday Society, the Biochemical Society, the Institution of Chemical Engineers, the Institution of Petroleum Technologists, the Oil and Colour Chemists' Association, the British Association of Chemists, the Association of British Chemical Manufacturers, the Chemical Club.

After an excellent dinner, with the toasts limited to the two loyal ones, the party adjourned to the ballroom, where dancing proceeded till after midnight.

Those who accepted invitations were as follows:

Adam, H. D., Mrs. Adam, Adams, C. A., Mrs. Adams, Aiken, J. H., Alliott, E. A., Miss Alliott, Arthur, C. F. B., Mrs. Arthur, Backes, J. V., Mrs. Backes, Miss Barlow, Barnes, H. F., Mrs. Barnes, Barratt, T., Barsby, R., Mrs. Barsby, Bennett, Lt.-Col., Mrs. Bennett, Bennett, A. N. C., Mrs. A. N. C. Bennett, Bennett, J. G., Mrs. Bennett, Mrs. R. G. Berchem, Blair, J., Mrs. Blair, Blake, A. E., Blattner, R. H. D., Mrs. Blattner, Board, A. V., Board, T. F. A., Mrs. T. F. A. Board, Board, T. H., Mrs. T. H. Board, Boby, W. V., Mrs. Boby, Bolton, L. H., Mrs. Bolton, Braun, H. C., Mrs. Braun, Briscoe, H. V. A., Mrs. Briscoe, Brown, R. B., Mrs. Brown, Miss Brown, Bush, H. J., Mrs. Bush, the Misses Bush, Calder, W. A. S., Cash, W. A., Mrs. Cash, Clark, F. W., Colgate, R. T., Mrs. Colgate, Collett, R. L., Comrie, L. J., Mrs. Comrie, Conway, A. E., Mrs. Conway, Cooling, J. W., Mrs. Cooling, Copley, E. D., Mrs. Copley, Cowie, G. A., Mrs. Cowie, Miss Cowie, Cowman, D. H. B., Mrs. Cowman, Crosbie-Walsh, T., Cullen W., Mrs. Cullen, Davis, E. N., Dawkins, S., Donnan, F. G., Miss Donnan, Drane, H. D. H., Dunn, F. P., Mrs. Dunn, Miss Dunn, Durrans, T. H., Mrs. Durrans, Dyer, B., Mrs. Dyer, Ellingham, H. J. T., Evans, E. A., Mrs. Evans, Evans, G., Mrs. Evans, Farrant, J. C., Finch, G. I., Mrs. Finch, Foott, C. H., Mrs. Foott, Forsyth, Mr., Mrs. Forsyth, Frank, F. B., Freeland, D. M., Mrs. Freeland, Gant, T. H., Gelpke, H., Mrs. Gelpke, Glinn, R. J., Mrs. Glinn, Grant, J., Mrs. Grant, Gray, F. A., Mrs. Gray, Green, H. E. J., Mrs. Green, Greene, F. A., Mrs. Greene, Griffiths, J. P., Mrs. Griffiths, Gross, E. G., Mrs. Gross, Hamer, Mr., Mrs. Hamer, Hay, N. C. B., Heaton, N., Mrs. Heaton, Heilbron, I. M., Mrs. Heilbron, House, C. J., Hughes, E. B., Mrs. Hughes, Miss H. Hunt, Hunt, J., James, R. O., Jephcott, H., Mrs. Jephcott, John, W. G., Mrs. John, Johnson, C. H., Mrs. Johnson, Miss G. Jones, Miss S. M. Jones, Jones, T. W., Josling, L., Joyce, A. G. E., Mrs. Joyce, Kent, F. G., Kenyon, J., Mrs. Kenyon, Miss Kenyon, Kershaw, W., Lambert, L. B., Mrs. Lambert, Lampitt, L. H., Mrs. Lampitt, Leonard, J. M., Mrs. Leonard, Miss Le Pla, Lowdell, D. P., Mrs. Lowdell, Miss Lowes, Lymn, A. H., McDowell, R. H., Mrs. McDowell, Mackie, D. R., Mrs. Mackie, Marlow, G. S. W., Mrs. Marlow, Marlow, H. N., Miss Marlow, Mrs. Mumford, Newell, E. F., Mrs. Newell, Nichols, J., Miss North, Northall-Laurie, D., Mrs. Northall-Laurie, Northall-Laurie, P., Oliver, Mr., Mrs. Oliver, Patrick, L., Pearce, L. R. B., Peel, P. R. E., Petrie, Dr., Mrs. Petrie, Phillips, J. T., Mrs. Phillips, Pilcher, R. B., Mrs. Pilcher, Piper, G. H., Pizey, J. H., Post, A. H., Mrs. Post, Potter, H. V., Pratt, J. D., Pyman, F. L., Mrs. Pyman, Reavell, B. N., Mrs. Reavell, Reavell, E. A., Mrs. Reavell, Richardson, E. F., Mrs. Richardson, Rimington, Mr., Mrs. Rimington, Robertson, J. H., Ronald, V. R., Mrs. Ronald, Ronca, J. F., and Guest, Russell, W., Mrs. Russell, Miss Russell, Sage, C. E., Miss Sage, Sanderson, J., Sayers, D. G., Mrs. Sayers, Scott, U. B., Seager, J. H., Mrs. Seager, Sim, L. A., Mrs. Sim, Skellon, J. H., Mrs. Skellon, Spielmann, P. E., Miss Standish, Stein, E., Mrs. Stein, Stevens, S., Mrs. Stevens, Stewart, R. F., Mrs. Stewart, Sutherland, D. M., Mrs. Sutherland, Sutherland, J., Miss Sutherland, Swindin, N., Mrs. Swindin, Thorpe, J. F., Mrs. Thorpe, Tungay, S. J., Miss Tungay, Twyman, F., Mrs. Twyman, Venn, R. J., Voelcker, E., Mrs. Voelcker, Miss Waddell, Walker, H. M., Mrs. Walker, Weber, I. E., Mrs. Weber, Wedgwood, P., Mrs. Wedgwood, Werner, R., Wexler, A., Mrs. Wexler, Wicking, R. W. H., Mrs. Wicking, Willey, W. Lloyd, Mrs. Willey, Miss Willey, Williams, J. A., Winter, R. M., Mrs. Winter, the Misses Wiseman, Wood, Dr. Florence, Wood, G., Mrs. Wood, Miss Wood, Woodley, C. B., Miss Wright.

On November 26 the British Association of Chemists celebrated its twenty-first anniversary by a banquet and dance at the Waldorf Hotel. The host and hostess at the reception were Dr. J. Vargas Eyre, President of the Association, and Mrs. Eyre.

The company was a brilliant one, and a very large number of eminent chemists and members of other professions were present. Most of the scientific bodies were represented.

After the loyal toasts, Professor F. G. Donnan, President of the Chemical Society, proposed the Twenty-First Anniversary of the British Association of Chemists in happy and humorous style, to which Drs. J. Vargas Eyre and E. F. Armstrong replied.

Dr. Eyre spoke of the birth and satisfactory growth of the young Association and briefly outlined its activities. One of its aims was to help the young chemist, and the unemployment benefit fund had since its inception paid out £13,000 and had accumulated funds of £17,000.

Chemistry and Industry was proposed by Dr. H. Levinstein, and Dr. L. H. Lampitt, representing the President of the Society of Chemical Industry, replied. Mr. S. Reginald Price, Past-President of the British Association of Chemists, toasted The Guests, and Dr. W. Cullen, President of the Institution of Chemical Engineers, responded.

The speeches were greatly enjoyed, and it was nearly ten o'clock when a movement was made towards the ballroom. Everybody took full advantage of the remaining time, and the whole evening was voted a tremendous success.

Among those present were:

Aldous, Mr., Mrs. Aldous, Aldrick, M. J., Mrs. Aldrick, Armstrong, Dr. E. F., F.R.S., Past President of the British Association of Chemists, Mrs. Armstrong, Astbury, S. J., Secretary, the Institute of Petroleum, Mrs. Astbury, Auld, Lt.-Col. S. J. M., O.B.E., M.C., D.Sc., President, the Institute of Petroleum, Mrs. Auld, Baker, A. J., Baly, Prof. E. C. C., C.B.E., F.R.S., F.I.C., Hon. Registrar and Past President, the British Association of Chemists, Mrs. Baly, Barry, T. Hedley, Bird, W. H., F.C.I.S., Secretary, the Institute of Brewing, Blair, J., Mrs. Blair, Miss Broderson, Bromfield, O. F. C., Miss Brosman, Burney, E., Chapman, E. A., *Chemical Age*, Churchman, A., Chairman, Birmingham Section, the British Association of Chemists, Clifford, F. W., F.L.A., Librarian, the Chemical Society, Cosbie, A. J. C., A.I.C., A.R.C.Sc.I., B.Sc., Chairman of Council, the British Association of Chemists, Mrs. Cosbie, Crosbie-Walsh, T., F.I.C., Mrs. Crosbie-Walsh, Cullen,

(*Continued on following page*)

REFRIGERATION AND HOME PRODUCE

THE British Association of Refrigeration held a meeting in the Hall of the Institute of Marine Engineers on December 6, when a symposium of papers was held.

The discussion was opened by Dr. Franklyn Kidd, who sketched the work done at the Low Temperature Station at Cambridge, an account of which appeared in the December issue of FOOD MANUFACTURE.

Mr. Giles E. Tuker, Chairman of the Essex Association of Fruit Growers, followed with the paper on Refrigeration in its Application to Home Food Produce, with special reference to fruit storage.

The Grower's Viewpoint

Mr. Tuker warned that he did not propose to treat fruit storage from a technical point of view, as he said that his listeners were better able to deal from this angle than he was. He spoke from the point of view of the dessert apple grower. He stressed the fact that the first problem that confronts the fruit grower is the right time of picking, and suggested that guessing plus experience were the only ways of arriving at a correct picking period.

The next problem was the wrapping of the apples *en route* to the store, and he said that this was one of the extremely difficult problems confronting the fruit grower. The average store of preserved apples contains approximately 500,000 fruits, and these have to be loaded and the store closed down within five days. He described this as "no mean athletic achievement". After enlarging on the problem of loading into store, Mr. Tuker dealt with some of the problems of the actual storage. He did not think that the actual operation of the stores and the adjustment of the correct CO_2 and O contents were difficult owing to the facilities offered by modern machinery and thermostatic control available.

Mr. Tuker dealt briefly with some of the fruit grower's problems, including (1) shrinkage, (2) bitter pit and (3) rot.

He concluded by saying that if gas storage is to take its proper place in the scheme of marketing, it will be almost essential to load straight from the tree into the container, putting the container straight into the store.

After the two papers had been read, a very animated discussion ensued which brought out the points of view of the growers, the chemists and the salesmen. The interest which the papers produced was amply demonstrated by this discussion, and it was only the late hour which forced the chairman to put the closure.

Learned Societies Dine and Dance (*Continued from preceding page*)

Dr. W., President, the Institution of Chemical Engineers, Mrs. Cullen, Damon, W. A., B.Sc., M.I.Chem.E., Chief Inspector of Alkali Works, the Ministry of Health, Mrs. Damon, Miss B. Davies, Davis, E. N., Deacon, W., Vice-President, the Pharmaceutical Society, Mrs. Deacon, Deacon, Mr., Mrs. Deacon, Dent, J. H., Chairman, Manchester Section, the British Association of Chemists, Miss Dickinson, Donnan, Prof. F. G., C.B.E., M.A., President, the Chemical Society, Miss Donnan, Dunlop, R. W., Hon. Secretary, Scottish Section, the British Association of Chemists, Evans, F. Page, Miss Evans, Eyre, Dr. J. Vargas, M.A., F.I.C.,, President, the British Association of Chemists, Mrs. Eyre, Faldo, W. A. K., Mrs. Faldo, Fife, J. G., Mrs. Fife, Floren, J., Fox, Dr. J. J., O.B.E., Government Chemist, Mrs. Fox, Frank, F. B., Garland, C. S., A.R.C.S., B.Sc., F.I.C., M.I.Chem.E., Past President, the British Association of Chemists, Mrs. Garland, Garvie, W., Mrs. Garvie, Gatehouse, F. B., Mrs. Gatehouse, Miss J. C. Gatehouse, B.A., Miss Gatehouse, Geary, W., Gibson, A. J., F.C.H., F.L.S., President, the Oil and Colour Chemists' Association, Gironimo, R. L., Grant, T. E., President, the Institute of Brewing, Green, Prof. A. G., F.R.S., M.Sc., F.I.C., Vice-President, the British Association of Chemists, Mrs. Green, Greenham, W., Mrs. Greenham, Gurr, G. T., Mrs. Gurr, Haas, Dr. P., Miss Halley, Halliday, E., Mrs. Halliday, Harman, C. S., Mrs. Harman, Harrison, J. B. P., Mrs. Harrison, Himus, Dr. G. W., Mrs. Himus, Holman, Prof. B. W., Editor, the Association of Scientific Workers, Mrs. Holman, Mrs. Hooke, Horton, E., Johnson, J. R., Jordan, Dr. L. A., A.R.C.Sc., F.I.C., M.I.Chem.E., Director, Research Association of British Paint Colour and Varnish Manufacturers, Mrs. Jordan, Kay, W., Hon. Secretary, Manchester Section, the British Association of Chemists, Keaton, J., Mrs. Keaton, King, V. P., Mrs. King, Knaggs, Dr. J., Mrs. Knagg, Kuenzli, R. A. C., Lampitt, Dr. L. H., M.I.Chem.E., representing the President, the Society of Chemical Industry, Mrs. Lampitt, Langwell, H., Mrs. Langwell, Lawrie, J. P., Mrs. Lawrie, Levinstein, Dr. H., F.I.C., Past President, the British Association of Chemists, Mrs. Levinstein, Linfoot, S., Mrs. Linfoot, Linstead, H. N., O.B.E., Secretary and Registrar, the Pharmaceutical Society, Mrs. Linstead, Littlejohn, W., Mrs. Littlejohn, Lloyd Willey, W. S., Mrs. Lloyd Willey, Miss Lloyd Willey, Lorains, J. P., Mrs. Lorains, Mrs. Lovelock, McLachlan, T., Mrs. McLachlan, Miss McLachlan, Mrs. Marriner, Mellersh, J. C., Merritt, D. L., Mrs. Merritt, Miall, Dr. S., B.Sc., Editor, Journal of the Society of Chemical Industry, Mitchell, Dr. Ainsworth, M.A., F.I.C., Vice-President, the Institute of Chemistry, Mrs. Ainsworth Mitchell, Moberly, A. H., M.A., F.R.I.B.A., Vice-President, the Royal Institute of British Architects, Mrs. Moberly, Morgan, Sir Gilbert, O.B.E., D.Sc., Sc.D., LL.D., F.R.S., F.I.C., A.R.C.Sc., Past President, the British Association of Chemists, Lady Morgan, Mullinger, L. W., Mrs. Mullinger, Mundy, C. W. A., Hon. Secretary, Oil and Colour Chemists' Association, Mrs. Mundy, Murray, F. G., Mrs. Murray, Myer, E., Hon. Secretary, Liverpool Section, the British Association of Chemists, Miss Nash, Newnham, H. A., O'Connor, Col. J., Mrs. O'Connor, Peck, W. C., Mrs. Peck, Miss Petty, Phillips, S. M., Pooley, H. J., M.I.Chem.E., General Secretary, the Society of Chemical Industry, Mrs. Pooley, Porter, Capt. R. P., Chairman, London Section, the British Association of Chemists, Press Association, Price, S. R., M.B.E., M.A., Past President, the British Association of Chemists, Miss Puddifoot, Rayner, E. A., Mrs. Rayner, Rhodes, C., President, Asphalt Roads Association, Ltd., Mrs. Rhodes, Rhodes, H. T. F., Hon. Editor, *Chemical Practitioner*, the British Association of Chemists, Mrs. Rhodes, Riley, G. C., Roberts, Prof. W. H., M.Sc., F.I.C., President, the Society of Public Analysts, Ryan, H. A., Mrs. Ryan, Salkfield, Major T., M.Inst.C.E., Secretary, Asphalt Roads Association, Ltd.; Scott, D. Shaw, M.Sc., F.C.I.S., Secretary, the Institute of Metals, Mrs. Shaw Scott, Shearer, Lt.-Col. J. D., Mrs. Shearer, Shearman, H. C., Mrs. Shearman, Smillie, R., Mrs. Smillie, Smith, W. J., Mrs. M. K. Spencer, Stitson, W. H., Stoyle, F. W., Mrs. Stoyle, Stuart, L. D., Mrs. Stuart, *Times*, Miss Tisserand, Miss Todd, Underwood, Dr. A. J. V., M.I.Chem.E., A.M.I.Mech.E., F.I.C., Hon. Secretary, the Institution of Chemical Engineers, Wakeford, L. E., Webster, A., Williams, J. A., Secretary, the Chemical Club, Miss Wilson, Woodcock, W. H., Hon. Treasurer, the British Association of Chemists, Woodley, C. B., F.C.R.A., F.C.I.S., General Secretary, the British Association of Chemists, Miss W. Wright, Hon. Secretary, London Section, the British Association of Chemists, Wylie, C. A., Mrs. Wylie.

Book Review

Not Crutches, but Walking Lessons, are Farming's Need,

advise Lord Astor and B. Seebohm Rowntree

THE POPULATION of this country consists of some 45 million people, 8½ million cattle, 25½ million sheep, 21½ million pigs, 70 million poultry, and a million houses. The animal population is thrice the weight of the human and has a considerably keener appetite, weight for weight. It is to the satisfaction of this appetite that British agriculture devotes nine-tenths of its acreage and nearly half its labour.

The agricultural problem, in all its complexity, boils down to a few simple issues: How far is it practicable and desirable for British agriculture to produce all the food required by both man and beast? What should the farmer be encouraged to grow that can now be more cheaply produced by the overseas farmer? Shall we promote or check the tendency for the livestock trade to become a processing industry for transforming cheap imported fodder, through the delicate chemical apparatus of the living animal, into food for human consumption?

Or as Lord Astor and B. Seebohm Rowntree put it in their preface to this new report,* "If . . . we may regard the total economic activities in these islands as those of one great business enterprise, what is to be produced by the Food Production Department of that business?"

The conclusions of this book favour the Middle Way of agricultural policy, the way of sound and conservative development. The book supports its conclusions with a mass of concentrated information about the technical and commercial trends of agriculture which a Royal Commission report could not have bettered.

It rejects flatly not only an extreme policy of self-sufficiency but any artificial development of British agriculture which would lose British industry its exports markets or unduly raise the cost of Britain's food. It points out that the consumer already pays 16s. per cwt. for Cuban sugar and 25s. 9d. for British; 5s. 9d. per cwt. for imported wheat and 9s. 1d. for British. Even if we were prepared to buy all our food supplies from British farmers at prices well above the world level, it would be fallacious, the authors point out, to assume that the farmers' expenditure of the purchase price would compensate industrialists for the loss of overseas markets. British farmers would have no use for the steel rails, machine tools, locomotives and the other manufactures which account for the most valuable part of our exports to countries overseas. This is a point of view which perhaps underestimates British industry's capacity for adaptation. Some foreign countries prefer to buy their steel rails, and so on, elsewhere; some can't pay for them; others make their own. Whether in the interests of agriculture or for self-preservation, many of Britain's export industries will have to change their products or their markets or both.

The positive proposals of the report advocate a five-point programme:

1. Encouragement of the production of those "protective foods" of which the consumers' diet is chiefly deficient and which British agriculture is happily in the strongest economic position to supply.

2. Knocking away the props shoring up the "sidelines" of farming, which are no more than processing industries based on imported foodstuff, or which tend to become producer-monopolies for the exploitation of consumers.

3. Maintenance of State help for agriculture on at least the same scale as at present but its transference to such functions as research and the improvement of the health of livestock and the fertility of the soil.

4. Stimulation of the efficiency of farming.

5. Reliance on a big scheme of storage against the emergency of war—storage of the imported foods themselves, and storage of fertility in the soil and of nourishment in the carcases of livestock. The authors envisage Britain at war eating its way through its herds while the pastures are ploughed up for cereal cultivation.

It cannot be said that this is a "popular" programme. It will not please whole-hog protectionists or self-sufficiency advocates. It gives no support to farmers who demand bigger and better subsidies, nor to the commercial vested interests created by the State's piecemeal experiments in fostering individual branches of agricultural production.

It provides a much more closely reasoned and convincing argument for the Government's present policy than any spokesman of the Government has yet offered, even though it severely criticises past legislative interferences and proposes reversals of policy in relation to beet-sugar, bacon, cattle and marketing boards which no Government relying on the rural vote could adopt unless it were riding for a Parliamentary fall. But Lord Astor and Mr. Rowntree back their arguments with so much evidence and state them after so objective a summing up of pros and cons that, even if the farming community finds them too hard to accept, it cannot resent them.

Pivot of the programme for increasing the supply of home-produced protective foods is a complete overhaul of milk production. This is dealt with in the most detailed and valuable section of the book. Reform, argue the authors, must begin with the cow. Her expectation of life is too short, her profitability therefore too low. If she stays in the herd three years her account breaks even, but for every year thereafter she earns £5 for her owner. Yet the average life of a dairy cow is only 4½ years—half what it should be. Only one cow in twenty dies of old age. The rest are slaughtered because of disease. Nothing is more important, it is contended, than measures to improve the health and extend the life of the dairy cow, and a big increase in expenditure on veterinary research is urged.

For the 65 per cent. increase in liquid milk consumption on which the report chiefly relies for a restoration of the dairy industry which should increase the herds by no fewer than 2½ million cows, a reduction in price following decontrol is postulated.

While recommending, in the interests of public health, measures to encourage largely increased production of vegetables, the authors concede that this would not materially increase agriculture's prosperity, and for a similar reason they recommend no special State aid to fruit growers. They deprecate the artificial expansion of pig production, argue that it should remain a by-product of farming, and point out that the dependence of the industry on imported feeding stuffs make this attempt at self-sufficiency a burden on national defence instead of an aid to it.

While giving full weight to the value of sugar-beet cultivation as strengthening the rotation at root-break, which was providing little cash for the farm accounts, they come to the conclusion that the impossibility of beet-sugar's ever being able to compete with cane-sugar—its price halved by improved cultivation—makes continuance of the subsidy unjustifiable. The guaranteed price for wheat was also, they hold, fixed at too high a level. In every branch of agriculture where British farmers are at a natural disadvantage compared with overseas producers they advocate a gradual withdrawal of public assistance. They conclude:

"It is only, we believe, through a steady increase in efficiency that we can hope to secure an expanding market for British agricultural products. . . . On the other hand, we have taken the line that several experimental policies that have been pursued in recent years with the object of stimulating particular branches of agriculture should be revised."

The State, in other words, will gently but firmly take away the crippled farmer's crutches and pay for lessons which will teach him how to walk. Perhaps Drs. Astor and Rowntree have given less than enough consideration to reviving the circulation of the atrophied limbs by stimulants to the price-system which is the bloodstream of farming.

A. E. B.

* *British Agriculture: A Report of an Enquiry organised by Viscount Astor and B. Seebohm Rowntree. Pp. 460. 15s. net.*

New Food and Drugs Act

(*Continued from page 22*)

Section 24 states that to milk for sale or possession for human consumption "no water or colour, dried, condensed or separated milk, or cream mixtures may be added".

Section 27.—If labelled "cream", packages for sale or conveyance must be that part of milk rich in fat separated by skimming or otherwise.

If labelled "artificial cream", must resemble cream and contain no non-milk ingredient except water (and possibly emulsifier). Such shall only be made on "registered" premises, unless for domestic use or intermediate manufactures.

Cheese is defined as the substance usually known containing no fat other than milk fat.

Section 32.—Butter may not contain over 16 per cent. water; defined as the substance usually known, made exclusively from milk with or without salt and other preservative and colour.

Margarine, a similar water limit and not over 10 per cent. milk fat, which must be declared to 2 per cent.; defined as any food which resembles butter, whether mixed with such or not.

Bread and Flour

Section 30.—Power given to make regulations, prescribing kinds of flour other than wheat, and other substances, for bread—but only when necessary or expedient for health and nutrition; or otherwise protecting purchasers.

Prescribing the descriptions under which such breads may be sold and marked.

Prohibiting or restricting the addition of any substance or the application of any treatment to flour (or bread) for sale—but again only "when necessary or expedient. . . ."

Controlling importation, preparation, transport, exposure, etc., of bread or flour to prevent health danger, etc.

Section 31.—If forbidden substances are found either in bakehouse or mill those in possession will be required to prove that such are not for use for sale.

Finally, the legal definition of "food" (p. 76) is important. It is "any article used as food or drink for human consumption, other than drugs or 'water', and includes: Any substance intended for use in the composition of food. Any flavouring matter or condiment. Any colouring matter for use in food".

In any case the addition of colours, flavourings, etc., to food or drink must comply with the regulations (Section 1) for all additions.

Development of Modern Evaporation

(*Continued from page 13*)

Special Types

These are now being developed where high-boiling organic liquids are handled, usually in the vapour phase.

The most successful of these use a mixture of diphenyl oxide 74 per cent., and diphenyl 26 per cent., known as "dowtherm". Diphenyl was first employed in 1926 by Dr. Francis X. Govers, a consulting engineer in the U.S.A., for distilling lubricating oil fractions under a high vacuum, but it was found that the eutectic mixture of the two compounds had a lower freezing point than either of the compounds. The great advantage of "dowtherm" for high temperature work is that the pressures can be kept very low—*e.g.*, at atmospheric pressure the saturation temperature is 258° C., compared with steam, 100° C. Again, at 40 lbs. per sq. in. the temperature is about 330° C., against steam at 141° C. It will be appreciated, however, that where steam at sufficiently high pressure is available "dowtherm" cannot be considered.

It will be appreciated that so many factors must be taken into account when installing evaporating plant in a factory, that correct choice is a matter of experience.

Vitamin D Incorporation in Foods

In an ordinary diet there is almost certain to be a shortage of vitamin D, a fact which is to-day recognised by the medical profession, as evidenced by the number of people, in particular nursing mothers and children, who take, under doctor's orders, one or more of the many vitamin D preparations on the market. The oldest and cheapest source of vitamin D is cod liver oil, but some people find this difficult to tolerate, so that malt and other extracts with cod liver oil, glucose-D, tonics and many other preparations are now almost as well known.

If additional vitamins, especially vitamin D, could be incorporated in general foodstuffs which are consumed by everyone, there would be no question of vitamin deficiency, a regular daily supply being assured at no extra cost to the public. Until recently this was impossible as regards the natural vitamins A and D, because these vitamins are derived principally from the livers of fish, and they could not be obtained without a fishy taste and odour which were imparted to the product in which they were incorporated. After some years of experimental work, however, these vitamins have now been isolated in various forms quite free from any obnoxious taste or smell, and they are obtainable under the trade name "Covitol".

In considering the foods into which additional vitamins could be incorporated, milk is the first which comes to mind, and to-day there would be no difficulty in offering this article with a standard minimum content of vitamins A and D by means of the addition of a very small quantity of a high potency vitamin emulsion which is tasteless and odourless.

Butter and margarine come next as suitable commodities to contain vitamins, as they are consumed more generally, especially by adults, than milk itself. Butter, being made from the cream of milk will, in the normal way, contain vitamins to the extent of about 12,000 International Units vitamin A and 250 International Units vitamin D per pound, and to-day most margarine on the market contains added vitamins. However, one could scarcely consume sufficient butter or margarine to obtain an adequate daily supply of vitamins A and D.

Custard powder and honey containing vitamin D can also be obtained to-day, and cheese, chocolate, cocoa and syrup, among many other things, are generally consumed foodstuffs in which a supply of vitamins could be easily incorporated. The accumulated effect of a small quantity only in a number of foodstuffs would be sufficient to supply the human system with the vitamins it requires.

NEWS FROM THE INDUSTRY

Vitamin B_1 New International Standard

The first International Standard for vitamin B_1, which consisted of an adsorbate of the antineuritic vitamin, made from rice polishings, on fuller's earth, has now been replaced by a preparation of crystalline vitamin B_1 hydrochloride. In recent years progress in the study of the antineuritic vitamin has been rapid, and this change in the form of International Standard has been made possible by the synthetic preparation of the vitamin in pure crystalline form.

Extensive international investigations of the properties of this material and, in particular, the determination of its potency in terms of the original international standard by a variety of methods have now been completed, and the members of the International Conference on Vitamin Standardisation have unanimously recommended that the sample be adopted as the Second International Standard for vitamin B_1, and that the International Unit be defined as the antineuritic activity of 3 microgrammes of the International Standard preparation. This recommendation has been adopted by the Permanent Commission on Biological Standardisation of the Health Organisation of the League of Nations.

As in the case of the other International Vitamin Standards, the new standard for vitamin B_1 is held, on behalf of the Health Organisation of the League of Nations, at the National Institute for Medical Research, Hampstead, N.W. 3, and is distributed therefrom to national control centres established in other countries for local distribution to laboratories, institutes and research workers; and to workers resident in countries in which the establishment of national control centres has not yet been completed.

Samples of the new standard have already been sent to the laboratories, institutes and research workers who have hitherto received the standard adsorption product. Others requiring the standards are asked to make application to the Department of Biological Standards, the National Institute for Medical Research, Hampstead, N.W. 3.

* * *

National Mark Scheme for Cheese

Revised regulations prescribing "Extra Selected" and "Standard" grades for Caerphilly cheese, in place of the present "Selected" grade, are proposed by the Minister of Agriculture. This is the power conferred on him by the Agricultural Produce (Grading and Marking) Acts, 1928 and 1931. Copies of the draft of these Regulations, which are described as Agricultural Produce (Grading and Marking [Caerphilly Cheese]) Regulations, 1938, are obtainable at 1d. from H.M. Stationery Office.

* * *

New Wavelength

Radio Normandy, whose advertising broadcasts are sponsored by many food firms, have secured, by international agreement, a new and better wavelength of 274 metres (1095 K/cs.). This was notified on December 10, and the switch-over was made two days later. Coinciding with this, the new Radio Normandy transmitter at Louvetot comes into regular service. International Broadcasting Co., Ltd., handle the advertising broadcasts in English from this station.

Free Passport Visas

All *bona fide* overseas buyers visiting the 1939 British Industries Fair, which opens in London and Birmingham on February 20, will be given free passport visas. This concession is extended to include the wives of buyers and their children under 18 years of age, even though they travel on separate passports. The visas can be obtained from the nearest British Consular Officer, and are valid for three months from the date of issue. Germany (including Austria), Russia, China, Japan and Ethiopia are among the countries to which the concession is made.

* * *

National Physical Laboratory Reduce Prices

The booklet issued by the Metrology Department of the National Physical Laboratory on tests on volumetric glassware should now have inserted a copy of the leaflet giving revised prices for tests. Pages 28-31 of this booklet are, therefore, now cancelled.

On the old schedule fees a discount of 33⅓ per cent. was allowed on batches of twelve or more vessels of the same type and capacity. The new fees are on a net basis and, generally speaking, are equal to less than the old fees less the 33⅓ per cent. discount previously only obtainable on batches of one dozen or more vessels of the same type and capacity sent together for tests. The new schedule also covers a considerably larger range of apparatus than the old.

* * *

Father and Son Built this Business

Almost coincident with the fiftieth anniversary celebrations which N. V. Polak and Schwarz's Essencefabbrieken of Holland are holding this month, the English branch of this firm of flavouring essence and essential oil manufacturers celebrated their 12½ years Jubilee on December 11.

It is a sad comment that the fiftieth anniversary will not be seen by either the founder of the firm or his son.

Leopold Schwarz founded "Polak and Schwarz" in 1889 when he started making flavouring essences in a few rooms in his father's house. He was proprietor, chemist, warehouseman and salesman, *he* was Polak and Schwarz. It was his outstanding enterprise that was the basis of the building of the firm to its present size when it has ramifications in Holland, France, Great Britain, Germany, U.S.A., and Italy, as well as agents all over the world. But Leopold Schwarz in the course of this terrific work had overtaxed his strength; he collapsed and died suddenly on May 5, 1920.

His son, Samuel Schwarz, shouldered the responsibilities of control. He had in large degree the admirable qualities of his father. Under his leadership new branch offices were established in London, Milan, Messina, New York and Shanghai. Following almost tragically in his father's footsteps he too died on September 11, 1938.

The concern is now controlled by Samuel Schwarz's cousin, Mr. Adolf Schwarz.

* * *

Progress in Northern Ireland

Fruit preserves, milk powder and maltings are among the new manufactures set up in Northern Ireland during the past year. Results of the first twelve months' working of the New Industries (Development) Act were reviewed at a Belfast luncheon on December 16.

MANUFACTURERS'

A review of literature published

Refrigeration Deal

Because they have recently taken up the manufacture of specialities other than refrigeration, and now find that the whole of the productive capacity of their Warrington works will be required for fulfilling these new contracts, the Liverpool Refrigeration and Engineering Co., Ltd., have arranged with J. and E. Hall, Ltd., of Dartford, for the acquisition by the latter of their refrigeration business. This arrangement has now been agreed upon between the companies. Liverpool Refrigeration and Engineering Co., Ltd., will complete all contracts they now have in hand, but do not now accept contracts for refrigerating machinery.

* * *

1837-1939

A book has been published which records the progress and growth of a Stamford engineering firm. It started when Queen Victoria ascended the throne—it still flourishes. The name of the firm changed with time; once it was known as T. W. Ashby and Co., late Smith and Ashby; no vestige of those names remains in its present designation of Blackstone and Co., Ltd.

The book was written by Mr. Thomas Price, who was associated with the firm for many years. He has in writing this book, as he puts it in his introduction, told "in little, the story of British industry over a century". Thus the book well deserves its title of *A Hundred Years of Progress*. Britain's commercial greatness was built upon the foundations provided by such sturdy firms as this. * * *

Chemistry of Amino Acids

"Amino acids are absorbed at a higher rate than could be expected from their calculated molecular volume and even at a higher rate considering the volume of the zwitterions of the ampholytes being enlarged by a shell of water dipoles. Varying the concentration, it appears that the percentage of absorption is not constant, but falls off with rising concentration. Evidently, these substances of physiological importance resemble the 'physiological' sugars (glucose, galactose). Their absorption is not like a diffusion, but is a process complicated by the presence of an accelerating factor, the effect of which becomes more visible with lower than with higher concentrations."

Thus Rudolf and Josephine Hober, of the Department of Physiology, School of Medicine, University of Pennsylvania.

Fredk. Boehm, Ltd., point out that both their "Protex" and pure yeast extract "Yeatex" contain many essential amino acids.

Steam Control

Accurate measurement by differential pressure of the flow of steam, water, air, gas or oil and other fluids is accomplished by the Kent "K.M." meter. This well-known instrument, which finds many applications in food factories as a recorder of steam quantities, is described in its many sizes and forms in a booklet issued by George Kent, Ltd. It is claimed that "modifications have recently been made which give still greater reserve of power, greater accessibility, greater simplicity and improved appearance". All the meters illustrated in the booklet, which is available from the firm, are adaptable for wall, panel or post mounting.

Whys and Wherefores of Food Colours

A booklet which deals thoroughly with the colouring of foodstuffs has been issued by Imperial Chemical Industries, Ltd., to promulgate their "Edicol" range of food colours. It is extremely informative. A range of twenty food colours is illustrated. The properties of the particular colour are listed and conditions indicating when it should be used are given.

A useful inclusion is the names of the countries which permit the use of the particular colour. For instance, two shades of yellow are catalogued, one slightly darker than the other. The lighter shade is permitted in France and sixteen other countries. The dark shade is not permitted in France, but is permissible in sixteen countries ranging from Belgium to Western and South Australia.

Air Filtration

A new catalogue issued by the Visco Engineering Co., Ltd., describes their patent self-cleaning air filters. It is claimed that these are not static filters adapted by the addition of an oil pump to wash the filter cells *in situ* and necessitating the stopping of the fan which moves the air, but operate for months without any part of the plant having to close down.

Botanical Drugs for Food Flavours

An interesting list of their botanical drugs is issued by Joseph Flach and Sons, Ltd. This firm, which was established in 1882, import and export practically every kind of botanical drug, such as medicinal and culinary herbs, roots, barks, leaves and seeds. Particularly interesting to the food manufacturer is the range of herbs for flavouring, which includes sage, thyme, mint, parsley, tarragon, etc., and the dried vegetables, such as powdered onion and horse-radish.

An installation by George Kent, Ltd., at the new factory of Heinz. The two panels comprise combustion efficiency meters and draught gauges; on the left is a KM/Cl steam flow meter. New Kent literature is described above.

PUBLICATIONS

by the suppliers of the Food Industry

Mechanical Handling

The handling of goods in factories is facilitated by transport by small trucks which operate in a number of ways. Ransomes, Sims and Jefferies, Ltd., have just issued a booklet on their electric trucks for use in factories and their environs. The trucks described range from the fixed platform to the elevating platform types.

Fractional Horse-Power Motors

A new fractional horse-power motor catalogue which consists of descriptive and price leaflets is available from Metropolitan-Vickers Electrical Co., Ltd. A prefatory leaflet first reviews the different types of such motors, indicating their special characteristics and their particular applications. More fully descriptive leaflets follow giving complete details of the various types.

For Food Machinery

Fittings for the food industry are specialities of Walworth, Ltd. Accessories for food factory maintenance are listed in a new catalogue and stock list. These include brass stop-cocks, gate valves, S traps, etc.

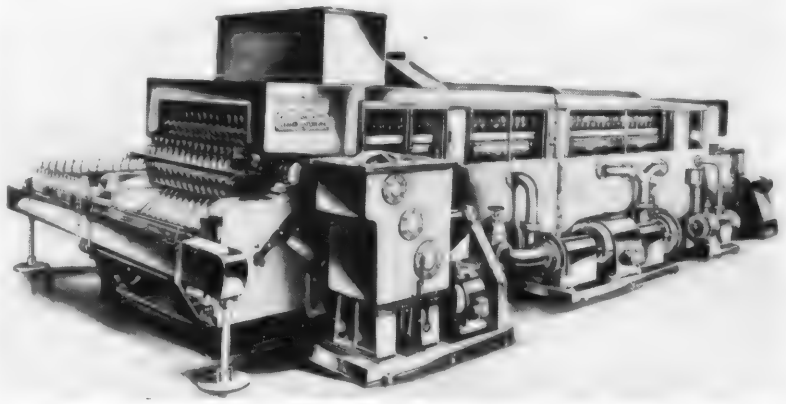
Printed Batch Analysis

The actual batch analysis of analytical reagents, clearly printed on labels attached to appropriate containers, is the latest improvement introduced by the General Chemical and Pharmaceutical Co., Ltd. This is considered to be a definite advance in regard to analytical reagents, presenting as it does much fuller information than mere maximum impurities. Below the analysis the following is printed on each label, "The above analysis is based on the results, not of our own Control Laboratories alone, but also on the confirmatory Analytical Certificate issued by independent consultants of international repute." A pamphlet fully describing the idea is issued by General Chemicals.

* * *

Rotary dryers and other drying plant for food factories are described in a leaflet issued by Pratchitt Bros., Ltd.

A new method for the clarification of fruit juice is the subject of a leaflet from the Alfa-Laval Co., Ltd. The machine for clarification is claimed to be very suitable for juices with a large sludge content and it is possible to clarify juices which have shortly before been treated in order to precipitate the impurities and prevent possible fermentation.



A descriptive picture of the Dawson "Super Hydro" bottle cleaner and steriliser. This has automatic feed and discharge, visible operation and an improved gear box. The "Geneva" movement for the intermittent motion of the bottles is incorporated. The machine complies with the Factory Acts, and the particular one illustrated deals with 8,000 bottles per hour.

Insulation and Testing

Two booklets are available from Evershed and Vignoles, Ltd.: one is a pocket-book on electrical insulation testing subtitled, "How to Avoid Electrical Breakdowns"; the other deals with continuity and polarity testing.

Refrigeration from the viewpoint of the bacon curing and allied industries is dealt with in a leaflet issued by the Lightfoot Refrigeration Co., Ltd.

Dryers, combustion plant, dust collection and separation plant are described in leaflet P.1001 published by the Buell Combustion Co., Ltd.

A bi-monthly leaflet, *Randall's Monthly News*, is published by James H. Randall and Son, Ltd., dealing with current topics and the firm's equipment for food manufacturers.

An interesting form of corrosion prevention which has a special application to food plant is that of metal spraying. Metallisation, Ltd., who are specialists in this process, have two booklets which deal thoroughly with the system.

The special application of their stoneware in the food industry is summed up in a leaflet from Doulton and Co., Ltd., *Chemical Stoneware for Food Manufacture*. Ten different applications are illustrated.

A new air-cooled engine, which has application to winches, elevators, lighting plant and other food factory machinery, is described in a leaflet issued by the makers, R. A. Lister and Co., Ltd.

Their circular chart type recorders for temperature and pressure measurements are described in a leaflet available from the Drayton Regulator and Instrument Co., Ltd.

The application in industry of self-lubricating bronze bearings is the subject of a booklet available from the Manganese Bronze and Brass Co., Ltd.

First Installation

Creamola Food Products, Ltd., have recently installed a flat bag filling and sealing unit for feeding by hand; this is believed to be the first installation of its kind in Great Britain, and it was supplied by a company of only nine months' production activity, Filling Machines, Ltd., of Glasgow. This company quite recently acquired the goodwill of the automatic machinery branch of Caldwell and Jackson, Ltd., and thus have in hand a reserve of designs, suitably improved for a wide range of other machines for the food industry.

Bricks Improve Cows' Health

A new type of cavity brick flooring for use in the accommodation provided for cows, pigs, and other farm animals is claimed to have an important bearing on the health of the animals and on the milk, bacon, etc., obtained from them. The principle is that the heat from the animal's body is soon transferred to the air enclosed in the cavity. This heat is retained when the animal rises to feed, and when it lies down again the floor is dry and comfortable. The warmth spreads throughout the entire floor and thus helps to maintain an even temperature in the cattle shed or sty. Woods Bros., Ltd., who make the flooring bricks, have on record that the milk yield has been increased when cows are housed in shippons with floors constructed from these bricks.

* * *

Change

B.E.N. Patents, Ltd., are to move early in 1939 to new offices and works at Hughenden Avenue, High Wycombe, Bucks. Telephone: High Wycombe 1630 (4 lines). Telegrams: "Tooinwun, High Wycombe". All communications should be forwarded to this address on and after January 3.

* * *

Control for Cunarders

Steel dial thermometers and thermocouple pyrometers for engine-room and boiler-house temperatures are being supplied to the new Cunarder, *Queen Elizabeth*, by Negretti and Zambra, well known for their control instruments for the food industry. Similar instruments were supplied to the *Queen Mary*.

O B I T U A R Y

Sir Robert McDougall

Born in 1871, Sir Robert McDougall, LL.D., B.Sc., was the son of Mr. Arthur McDougall, of the City Flour Mills, Manchester, which firm later became McDougalls, Ltd., and finally McDougalls Trust. He was educated at Manchester University and Weimar and graduated B.Sc. at Manchester. He took his place in the family business, but held directorships in other concerns, including the Peterborough Brickworks.

He devoted his energies mainly to the manufacture of self-raising flour, of which his firm were pioneers.

Although always attentive to the calls of his business, Sir Robert was better known to the general public for his generosity to the National Trust, his great efforts for Manchester University and his essays into politics.

In spite of his great national offerings he did not forget the maxim that charity begins at home, and the city of Salford and his *alma mater*, Manchester University, benefited in a most substantial way by his generosity.

He became a member of the Court of Governors of the University in 1923 and in 1931 accepted the post of deputy treasurer. The University acknowledged his services last year by conferring on him the degree of LL.D. His national generosity was rewarded by his knighthood on the eve of the Coronation.

On Thursday, December 15, he died, as he would have wished, virtually in harness. As he was returning home from a board meeting of McDougalls Trust he passed away. His memory will last long.

* * *

Food Storage Advocate Dies

Mr. W. P. Dreaper, O.B.E., F.I.C., consulting chemical engineer, died on December 2. He was Chairman of the Technical Committee of the League of Science and took an extraordinary interest in the question of food storage in warfare, having gathered round him a body of experts in whom by virtue of his personality he inspired enthusiasm.

Sir Robert McDougall

Mr. Dreaper had a world reputation due to the fundamental technical improvements which he introduced into the artificial silk-making process.

He was appointed superintendent, during the war, of the Government factories at Sutton Oak (War Office) and Ellesmere Port (Ministry of Munitions).

He was a member of the Society of Dyers and Colourists, and had also been a member of the council of the Institute of Chemistry.

Recently he became actively interested in the preparation of bibliographies for research and industrial use and was honorary secretary of the Central Agricultural and Scientific Bibliography, the work of which was described on page 336 of the November issue of FOOD MANUFACTURE.

Mr. Dreaper was born in 1868, receiving his education at the Finsbury Technical College.

Quick-Freezing Makes Big Strides (*Continued from page* 18)

It remains in the tank in contact with the chilled brine until the contents are frozen. Following this, other switches are opened and the units run by gravity to a point where they are picked up by a power-driven chain, the only moving part in the entire apparatus. The chain conveys the units to a thawing well, where they are immersed for a few moments to loosen possible adhesion. Then each unit is up-ended and the containers dumped into a casing machine, from which they emerge ready cased and thoroughly frozen, completely processed and ready for storage and shipment.

Being wholly encased in a film of ice the products cannot be reached by air, and thus oxidation cannot take place.

Unclassified Methods

The submerged tube method, developed by William Finnegan (*Food Industries*, May, 1937, p. 239), freezes a liquid (fruit juice) in cans, which are pushed through the tubes. With the tubes immersed in 40° refrigerant, freezing is done in about 15 minutes.

With the "Cridericed" method of freezing poultry, developed by John N. Crider (*loc. cit.*, p. 246), a paper tube is inserted into the eviscerated body cavity, extending from the crop opening at the neck to the vent through which the viscera have been removed. Then the giblets and a small quantity of clean water are filled into the cavity around the tube, and refrigerated brine at 3° to 5° F. is pumped through the tube.

INFORMATION AND ADVICE

Vegetable Shortenings — Fat in Cheddar Cheese; Pasteurisation — Mustard Sauce Recipes — Salad Cream — Worcester Sauce Recipe — Non-Separating Mayonnaise — Savoury Duck — Information Supplied

Vegetable Shortenings

4,649. *We are interested in material covering the manufacture of cooking fats for household use. Could you suggest where we can secure information governing the processing, and equipment required for this purpose?* (New Brunswick.)

Vegetable shortenings are usually made from mixtures of vegetable oils, such as cotton seed or nut oil, which have been completely hydrogenated. The hydrogenated oil is then mixed with a little of the refined raw oil to produce shortenings. Alternatively, an almost similar product may be obtained by hydrogenating a raw vegetable oil to about 90 per cent. of saturation.

The names of suppliers of equipment were given.

Fat in Cheddar Cheese; Pasteurisation

4,750. *Are there any Government regulations stating what the fat percentage (dry state) should be in Cheddar cheese? What is pasteurisation?* (Mitcham.)

There is no legal standard for the percentage of milk-fat in cheese, but prosecutions for deficiency of fat are not uncommon, the justices being asked in such cases to fix their own standard on the basis of the expert and trade evidence before them. The percentage of milk-fat in cheese varies in different varieties of cheese. A minimum of 45 per cent. of milk-fat in the dry material has been suggested for whole milk cheese. (*Bell's Sale of Food and Drugs.*)

Pasteurisation is a term used to describe a heat treatment applied to milk to produce a safe degree of sterilisation. Various methods are used:

1. Flash pasteurisation, in which milk is heated to 160°-170° F. and then immediately cooled.

2. Continuous flow method, by which the milk is held at a temperature of 145°-150° F. for thirty minutes during its progress through the plant.

3. The holder process, consisting of—

(*a*) Batch pasteurisation, in which milk is held in tanks for thirty minutes at 145°-150° F.

(*b*) Continuous positive holding pasteurisation, a variation of (*a*).

4. Pasteurisation in bottles, a further modification of the holder system, but which has not made much headway in this country.

Mustard Sauce Recipes

4,558. *Please send us recipes for making mustard sauces, simple recipes of good keeping quality.* (St. Albans.)

Here are two recipes which should be used as a basis for experiment:

FRUIT SAUCE

Dates	15 lb.
Apple pulp	2 gal.
Tomato pulp	1 ,,
Onions	18 lb.
Garlic	2 ,,
Salt	4 ,,
Cayenne	1½ ,,
Ginger	1½ ,,
Vinegar (16 gr.)	26 gal.
Acetic acid (60 per cent.)	½ ,,

Peel and chop onions and garlic. Soak ground spices in water for forty-eight hours. Gently simmer all for thirty minutes. Pass through a fine sieve. Bottle at over 185° F.

MUSTARD RELISH

Vinegar (90 gr.)	11 gal.
Starch	12½ lb.
Mustard flour	12½ ,,
Turmeric	½ ,,
Sugar	17½ ,,
Salt	7 ,,
Water	5 gal.

Salad Cream

4,610. *We wish to experiment and ultimately market a salad cream. Could you favour us with any suitable recipes and advice on the manufacture of this class of article, and if any preservative is necessary to keep it fresh for some time after bottling?* (Devon.)

Salad cream can be made without the use of heat. Preservatives are not allowed by law.

If you have a stable emulsion and your oil does not contain free acid it should keep satisfactorily if bottled in airtight containers. You must be careful to avoid beating air into the mixture and to prepare it under perfectly hygienic conditions; utensils must be dry. The vinegar, mustard and salt will act as preservatives. Omitting flavouring agents which do not affect the persistence of the emulsion, the following is a typical formula:

Oil	75·0 per cent.
Salt	1·5 ,, ,,
Egg yolk	8·0 ,, ,,
Mustard	1·0 ,, ,,
Water	3·5 ,, ,,
Vinegar	11·0 ,, ,,

The oil is dispersed in the aqueous phase (water and vinegar) with the aid of the emulsifying agents (egg yolk and mustard) and a high-speed beater of the wire whisk type. For a gallon batch the egg yolk and solid mixture

is beaten for five minutes, addition of the oil takes another ten minutes, and the addition of the vinegar one minute. Finally, the mixture is stirred for one minute at slow speed. The beater should be below the surface. We suggest you reduce the oil proportion if the flavour is oily. Do not let any oil drop into the finished batch, as this will cause separation.

Worcester Sauce Recipe

4,629. *Please let us have a recipe for Worcester sauce to make as a marketable product.* (Manchester.)

The following is a recipe for Worcester sauce:

West Indian tamarinds	50 lb.
Shallots	12 ,,
Garlic	12 ,,
Foot sugar	50 ,,
Salt	20 ,,
Cayenne	1½ ,,
Ginger	4 ,,
Pimento	1 ,,
Cinnamon	1 ,,
Mace	½ ,,
Cloves	½ ,,
Lime juice	12½ gal.
Indian soy	5 ,,
Vinegar (16 gr.)	74 ,,

Boil the tamarinds with 10 gal. of the vinegar and pass through a pulping machine to remove stalks and stones. Dissolve the sugar in 10 gal. of the vinegar by boiling and pass through a fine sieve. Place all ingredients in a pan or vat and simmer for an hour. Pass through a flat stone mill followed by a fine sieve. We would point out that the quality of the sauce which you ultimately obtain is very much dependent upon the method of manufacture, which must be carried through with care at every stage, with which you will be familiar.

Non-Separating Mayonnaise

4,607. *Would you tell us how to obtain a mayonnaise which will not separate? The mayonnaise sold here in Sweden has a very thick consistency and is almost as stiff as to allow a spoon to stand upright in it. Such a mayonnaise contains about 75 per cent. oil. For the making of mayonnaise we have installed a valve homogeniser and have made several experiments on this machine to get stability on the product, but without success. The mayonnaise has separated even after reducing the quantity of oil considerably. It is, however, very necessary for us to obtain a mayonnaise of great stiffness. Could you explain why the mayonnaise separates when homogenised and not when beaten in an ordinary mixer, the same quantity of oil being used? In case you say that the surface of oil which is to be covered will be enormously enlarged when homogenised we would ask why the homogenised mayonnaise will not become thick, not even if saturated with oil to the breaking point during the homogenising process.* (Sweden.)

Your problem as stated concerns the mechanical means of manufacture, but it must be remembered that the other aspects of the problem—the ingredients and their respective proportions, the procedure, order of mixing, and temperature, etc.—all play a part. Mayonnaise is an oil-in-water emulsion, and it is necessary to start with the water and add the oil gradually, because if you start with the oil a water-in-oil emulsion will result, which is the opposite of what you require. The preliminary mixing of the water and oil should be made as thorough as possible, and it is advisable to agitate the mixture during homogenisation, otherwise there may be large globules of oil floating in the aqueous mass, and consequently at times only oil will be passing through the aperture, making for inefficient dispersion.

The egg material is the principal emulsifying agent, and the quantity used determines the nature of the finished product to a great extent. Its powers are affected by the acid of the vinegar to the extent of the relative quantities of each. Some makers find that with a mayonnaise containing 75 per cent. of oil, several passages through the machine are required, starting with a dilute emulsion as the equivalent of the aqueous phase for the further incorporation of oil. A stiff product can be made with less oil and without a stabiliser, provided the egg yolk and oil are at a maximum. On the other hand, a vegetable gum can be used to provide the stability and thickness required. These gums are harmless and tasteless and conform to the Food Laws of all countries. We suggest, however, that you experiment with the pressure used in the homogeniser. A pressure of 250 lb. per sq. in. may give excellent results, while one of 2,000 lb. may give a product that separates easily. High pressures may break the emulsion, and this seems to explain why the mayonnaise separates when homogenised, and not when beaten in an ordinary mixture. Low pressures and efficient emulsification should be the basis of your experiments.

Savoury Duck

4,644. *Could you tell us how to make "savoury ducks"? We require a cheap line retailing at 1s. to 1s. 6d.* (Solihull.)

We presume you mean by savoury duck what is also called mock duck, and, if this is so, you might try the following recipe:

Make the usual type of veal stuffing, and spread over a not-too-thick steak, roll up meat and flatten to duck-like shape. Place in a casserole with a little dripping and bake for one and a half hours. A few very small onions and diced carrots may be added. During baking, water is added to make up for evaporation. The article is improved by browning at the end of the cooking process.

Information Supplied

4,628. *The name and address of a firm making swansdown filter bags.* (Hereford.)

The names of firms were given.

4,666. *Manufacturers of vacuum redistillation plant for redistilling East Indian sandalwood oil.* (London.)

Manufacturers of this type of plant were given.

4,703. *The names of reliable firms who are milling almonds in different grades.* (Cape Town.)

The names of firms were given.

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RECENT PATENTS

These particulars of new patents of interest to readers have been selected from the "Official Journal of Patents", and are published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

Latest Patent Applications

34022. BILLINGHAM, U.: Clip device for hanging sides of bacon, etc. November 23.
33905. BOEHM, LTD., F., and REWALD, B. A.: Manufacture of products from eggs. November 22.
33084. SCHRODER AND CO. and KNOLLENBERG, R.: Manufacture of margarine, etc. November 14.
32410. BOYD, J. R.: Device for separating cream from milk. November 8.
31888. MACILWAINE, A. W.: Treatment of cocoa beans, etc. November 3.
31861. SCHMIDT, C. (SCHMIDT): Preparation of neutral fats, etc. November 3.

Complete Specifications Accepted

495,671. DEUTSCHE HYDRIERWERKE AKT.-GES.: Method of and means for protecting goods from pests.
495,503. TRIGGS, W. W. (BUROW, E.): Method of wrapping pressed yeast.
495,206. VICKERS, H.: Method of preparing meat or fish packed in sealed containers.
495,152. GES. FÜR PATENTVERWERTUNG: Plant for freezing and storing fish on ships.
494,911. DUBBERS, H.: Preparation of crustless cheese.

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.

Abstracts of Recent Specifications

Group Abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, either sheet by sheet as issued on payment of a subscription of 5s. per Group Volume, or in bound volumes price 2s. each.

Medicines as Foods

A preparation of vitamin A or other food or medicinal substance in gelatine is produced by incorporating the desired substance in aqueous gelatine, emulsifying in an oil which is soluble in an organic water-extracting liquid, causing the gelatine particles to gel, and removing the oil and at least a part of the water by means of the water-extracting liquid. Alternatively, the oil may be partly removed by a solvent such as ether, and then the rest of the oil and at least part of the water are removed by the water-extracting agent. Suitable water-extracting liquids are alcohol, acetone, propyl, and isopropyl alcohols and dioxane, and suitable oils are castor, soya bean, cottonseed, and mineral oils. Anti-oxidants and sugar and/or glycerine may be added to improve the keeping qualities of the product. In examples, (1) a vitamin A solution or concentrate is incorporated with 40 per cent. aqueous gelatine at 65° C., castor oil with or without alcohol is added, a polyphase emulsion is produced, and the mixture is cooled to or below 8° C. to cause the gelatine to gel. Alcohol is then added and the mixture is treated in a mortar or jar-mill, filtered, and the gelatine particles are washed with alcohol and allowed to stand in alcohol until dehydrated; the particles are finally dried, preferably not above 30° C. (2) Vitamin A solution is emulsified at 65° C. in 35 per cent. aqueous gelatine containing sugar and glycerine, and the mixture is emulsified with castor oil at 65° C., cooled to gel the gelatine, and the oil and water are extracted with acetone, the particles being dried in an air-chamber. Specification 490,001 is referred to.

491,212. Glaxo Laboratories, Ltd., and Reynolds, S.

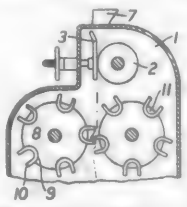
Food Preparations; Starch

A product having yeast-activating and flour-improving properties is obtained by cooking starchy material—*e.g.*, potatoes—to gelatinise at least partly the starch and subjecting a wet mixture of the cooked material and an edible acid salt to an elevated temperature to dextrinise at least partly the starch and drying the mixture—*e.g.*, by spray-drying or drying on a drum. Other edible salts having flavour-improving and yeast-activating properties may also be included. In the example given, potatoes are steamed or boiled to cook them thoroughly and partially gelatinise the starch—*e.g.*, in a cooker, which delivers the cooked potatoes to a peeler. Seven parts by weight of the potatoes are next mixed with one part of a mixture of 62 per cent. of monocalcium phosphate, 10 per cent. of calcium sulphate, 8 per cent. of ammonium chloride, and 20 per cent. of sodium chloride, the salt mixture being dissolved in a small quantity of water. The mixture is reduced to a smooth paste or liquid, according to the water content, by thorough mixing at about 160° to 200° F. For spray-drying the mixture is prepared in semi-liquid form and sprayed by a homogenising atomiser downwardly into a stream of hot air delivered to the drying chamber at 400° to 500° C., the starch in the product obtained being partially dextrinised. Four parts by weight of the product may be added to 96 parts of wheat flour.

491,569. Bowen, W. S.

Cleaning Intestines

In a machine for cleaning intestines the cleaning rollers 8 have teeth 10 of a flexible material—*e.g.*, rubber or leather, arranged in pairs, the teeth of the rollers inter-engaging and acting upon the intestine, which is, as usual, conveyed at a speed slower than that of the teeth, so that the teeth subject the intestine to a scraping operation. The teeth may comprise straps 10, which are secured in grooves 9 by bars 11 screwed to the rollers 8. The intestines are admitted through a hopper 7 in the top of the casing 1 and are fed by a roller 2 co-operating with an adjustable pressure plate 3.



492,086. Dam, F. C.

Preserving Meat

Meat which has been subjected to preliminary chilling is stored in a storage chamber containing an atmosphere consisting of air and ozone and no other constituents in appreciable proportions generated by an ozoniser, the high-tension electrodes of which are not exposed to the atmosphere. The pressure of the atmosphere in the chamber may be above, equal to, or below atmospheric, and the temperature in the chamber may be above 32° F.—*e.g.*, 35° F. The ozonisers used may be constructed as described in Specifications 461,217 and 462,767 (both in Group XL).

492,612. Nevanas, S. V.

Cereal Preparations

Particles of cereal grains, preferably screened for uniform size, are cooked in water in a rotary steam cooker at about 18 lb. pressure, and are then dried in a current of cool air till they have a moisture content of approximately 28 to 33 per cent. The grits are then passed through a separating machine to segregate the particles and are subjected to pressure, as by rolling, to flatten or deform the particles without reducing them to flakes. The flattened particles are dried, preferably to a moisture content of about 12 per cent., and are subjected to "gun-puffing," finally being dried to a moisture content of about 2 per cent. Whole grains may be used instead of particles. The product may be flavoured after puffing by the addition of salt, sugar, or saccharine; it may serve as a base to be coated with candy, syrup, or cheese.

491,386. Kellogg Co.

NEW COMPANIES

Aston's Stores (Aldridge), Ltd. (346,025.) November 9. Grocers, confectioners, bakers, etc. £1,200. Dirs.: R. Aston, 100, Foley Road, Streetley, Staffs; R. F. Aston, 584, College Road, Kingstanding, Birmingham; L. S. Aston, 21, High Street, Aldridge, Staffs.

George Barber and Sons (Coventry), Ltd. (346,399.) November 19. Wholesale grocers. £10,000. Permt. dirs.: W. N. Barber, Bryn Glas, Park Road, Coventry; Miss E. M. Barber, 74, Stoney Road, Coventry; Gertrude M. Barber, Beechwood, Westwood Heath Road, Coventry.

R. A. Bellham, Ltd. (346,129.) November 11. 80, High Road, Willesden Green, N.W. Butchers, etc. £2,500. Dirs.: R. A. Bellham and Mrs. A. E. Bellham, 307, Grove End Gardens, St. John's Wood, London, N.W. 8.

Central Counties Ice-cream, Ltd. (346,257.) November 16. 44, Wellington Road, Dudley, Worcs. To take over the bus. of ice-cream mchts. cd. on at Wellington Road, Dudley. £5,000. Dirs.: A. Pioli, 44, Wellington Road, Dudley; F. W. Gould, 11, Bradley Street, Tipton; F. A. Fletcher, Stockwell End, Wolverhampton.

Economic Tea and Supply Co., Ltd. (345,495.) November 23. 213, Edmund Road, Sheffield. Mnfrs. of and dlrs. in and distributors of tea, coffee, cocoa, etc. £5,000. Permt. dirs.: F. G. Simpson, 162, Springfield Road, Sheffield; J. Northeast, 19, Meadow View Road, Sheffield; W. Northeast, 2, Hastings Mount, Sheffield.

Elkes and Fox, Ltd. (346,008.) November 8. To take over the bus. of biscuit mnfrs. cd. on at Red Cat Lane, Burscough, Lancs, by Lavery's Biscuits, Ltd. £25,000. Dir.: M. S. Fox, Biscuit Works, Batley.

Nicholsons (Caterers), Ltd. (346,481.) November 22. Café proprs., caterers, etc. The Empire Café, 15, Bradshawgate, Bolton. £5,000. Dirs.: J. L. Livesey, 137, Smithills Dean Road, Bolton; F. Nicholson, 5, Abercorn Road, Smithills Dean Road, Bolton.

Overseas Produce Trading Co., Ltd. (346,352.) November 18. 57, Gracechurch Street, London, E.C. 3. To import, export, buy, sell, and deal in fruits, vegetables, wines, canned goods, foreign and colonial produce, etc. £2,200. Dirs.: To be appointed by the subs.

Qualitybake, Ltd. (346,459.) November 21. 23-4, Bridge Street, Bristol, 1. Bakers, etc. £2,000. Dirs.: F. C. Richardson, 59, Queen Charlotte Street, Bristol; H. Gattiker, 81, Oakfield Road, Selly Park, Birmingham.

W. Richards (Aston), Ltd. (345,945.) November 5. Pork butchers and ham and bacon curers. £2,000. Permt. dir.: J. B. Mayers, Packwood, Shirefoot Lane, Four Oaks, Warwickshire.

G. C. Russell (Bakers), Ltd. (345,928.) November 5. 1, High Street, Newport, I.O.W. Bakers, confectioners, and retail grocers. £1,200. Dirs.: G. C. Russell, Llangua, Whitepit Lane, Newport; W. J. Fallick, 2, East View, Newport; L. Jennings, 6, Clarence Road, Newport.

Sullivans (Fruiterers), Ltd. (345,909.) November 4. To take over the bus. of fruiterers cd. on at 22 and 41, Craven Park Road, Harlesden, N.W. 10, and at 250 and 260, Kentish Town Road, N.W. 5. £9,000. Dirs.: W. A. Hailey, 250, Kentish Town Road, N.W. 5; C. F. Hailey, 10a, New Parade, Craven Park Road, Harlesden, N.W.

Ward and Strong, Ltd. (346,574.) November 24. 47, Great Russell Street, London, W.C. 1. Retail and wholesale butchers and provision mchts. £6,000. Dirs.: F. D. Ward, 9, Sunnyfield, Mill Hill, London, N.W. 7; G. E. Strong, 222, Hale Lane, Edgware, Middlesex; A. C. Ward, 98, Stag Lane, Edgware, Middlesex.

Willow Restaurant and Café, Ltd. (346,367.) November 18. Restaurant and café proprs. 15, Eastcheap, London, E.C. 3. £1,000. Dirs.: To be appointed by the subs.

Wood's Table Dainties, Ltd. (346,180.) November 12. Mnfrs. of and dlrs. in foodstuffs, etc. £10,000. Permt. dirs.: C. B. Wood, Normandy, Devonshire Avenue, Amersham; W. Leuw, 20, Queen's Court, Queensway, London, W. 2.

The above-mentioned particulars of new companies registered are taken from the Daily Register compiled by Jordan and Sons, Ltd.

TRADE MARKS

BENCREST. — 601,493. **Edible oils and edible fats.** BENNINGA (MITCHAM), LTD., 33, Mortimer Road, Mitcham, Surrey. (Associated.) November 23.

BEVAMEDE. — 585,409. **Milk products for food.** BEVAMEDE DAIRIES, LTD., Wicklow Lodge, Melton Mowbray, Leicestershire. (By Consent.) November 16.

CANOVIS. — 583,294. **Flour.** HOVIS, LTD., 154, Grosvenor Road, Westminster, London, S.W. 1. (Associated.) November 23.

CUPID.—586,258. **Biscuits, but not including chocolate biscuits.** W. AND R. JACOB AND CO. (LIVERPOOL), LTD., 286-316, Scotland Road, Liverpool. (By Consent.) December 7.

Chocolate biscuits will be struck out from the goods of Registration No. 320,369 (1675) if and before the applicants' mark is registered.

DAY DREAMS.—601,536. **Chocolate and confectionery.** ROWNTREE AND CO., LTD., The Cocoa Works, Wigginton Road, York. (Associated.) December 7.

ELEPHANT.—601,594. **Yeast.** T. WHITTICK AND SON, LTD., 48, Cogan Street, Hull. (Associated.) November 23.

EXPRESS.—587,072. **Lard (for food) for sale in the United Kingdom of Great Britain and Northern Ireland and for export, except to Africa.** ROBERT WILSON AND SONS (BARRHEAD), LTD., Royse Road, Trafford Park, Manchester. November 16.

FLAVIA.—582,998. **Cooked meats for human consumption.** R. W. HOLDEN, LTD., Primrose Factory, Ratcliffe Street, Darwen, Lancashire. (By Consent.) November 16.

HIGHLIGHTS.—601,757. **Chocolate and confectionery.** ROWNTREE AND CO., LTD., The Cocoa Works, Wigginton Road, York. November 23.

LUVITA. — 601,926. **Preparations for making beverages.** THE ENGLISH AND SCOTTISH JOINT CO-OPERATIVE WHOLESALE SOCIETY, LTD., 100, Leman Street, London, E. 1. (Associated.) November 30.

MILCON.—601,732. **Milk concentrate (for food) and condensed milk.** KRAFT CHEESE, CO., LTD., Silverdale Road, Hayes, Middlesex. December 7.

MORNING MIST.—601,410. **Fish, fruit, vegetables, and jam, all being canned goods.** SALE, TILNERY AND CO., LTD., 3, Lloyd's Avenue, London, E.C. 3. November 16.

PROLAC.—600,896. **Milk foods for infants and invalids.** COW AND GATE, LTD., Cow and Gate House, Stoke Road, Guildford, Surrey. (Associated.) December 7.

SEROLAC.—B 586,647. **Milk sugar (for food).** WHEY PRODUCTS, LTD., London House, 35, Crutched Friars, London, E.C. 3, and The Factory, Haslington, near Crewe. (By Consent.) November 23.

User claimed from December 15, 1928.

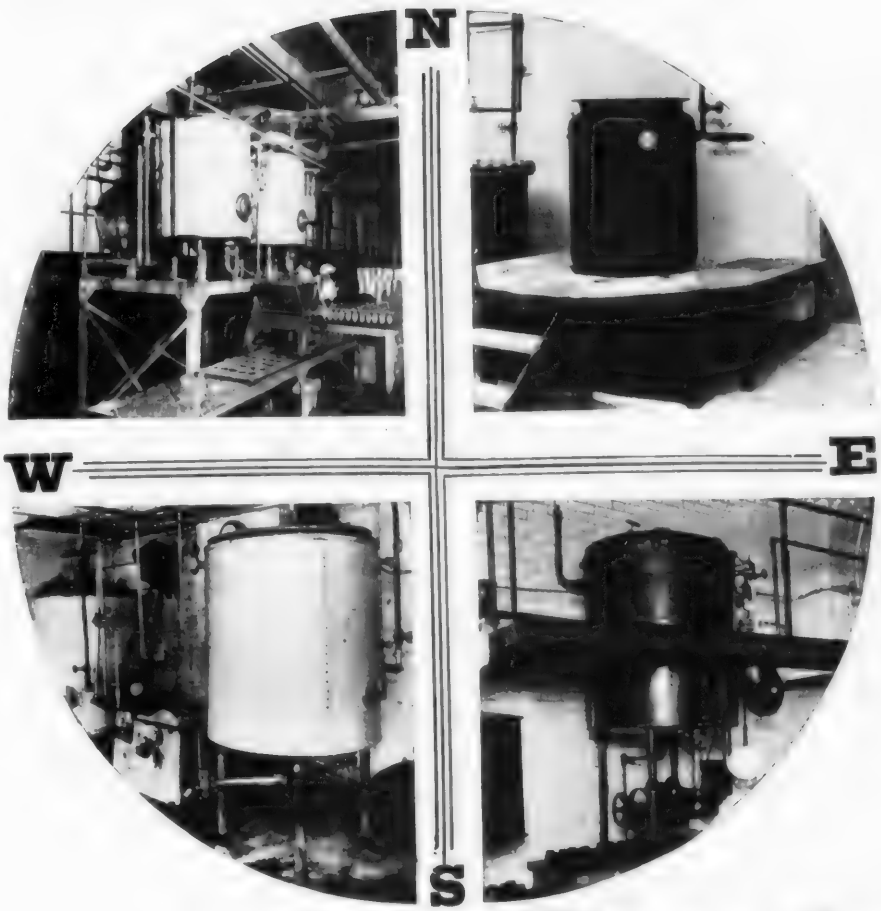
SHOPPING TIME. — 600,270. **Biscuits (not being food for animals).** BURTON'S GOLD MEDAL BISCUITS, LTD., Buchanan Street, Blackpool. November 16.

SPAM.—600,993. **Preparations in tablet or liquid form for use in colouring meat products.** JOHN CRAMPTON AND CO., LTD., Pomona Spice House, Altrincham Road, Sharston, Wythenshawe, Manchester. November 23.

SUNCLAD. — 601,445. **Fresh fruits.** NESTOR P. SIMOES AND CIA LTDA., Avenida Rio Branco 9, Rio de Janeiro, Brazil. November 16.

TOTEM. — 602,340. **Chocolates.** C. KUNZLE, LTD., 156, Broad Street, Birmingham, 15. December 7.

This list of trade marks of interest to readers has been selected from the "Official Trade Marks Journal", and is published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).



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These four points characterize PFAUDLER

Pfaudler Glass-Lined Equipment is known in all parts of the world for its hygienic construction. Below are given just four reasons that recommend its use by Food Manufacturers—others will be found in our catalogue FP.15 for which we invite you to write.

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EASY TO CLEAN. The smooth glass lining is easily and thoroughly cleaned with the minimum of time and effort. It affords no crevices in which harmful bacteria may lurk and breed.

WITHSTANDS ACIDS. Pfaudler Glass-Lined Equipment remains inert in the presence of acids which are responsible for the retention of natural food colour and flavour.

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PFAUDLER *glass-lined steel* EQUIPMENT

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FOR STEAM AND WATER SUPPLIES— QUICK AND EASY TO OPERATE

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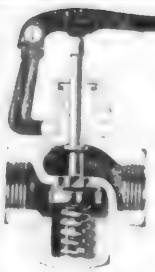

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The valves are heavily made in gunmetal, fitted with renewable composition discs for any service, giving long life with low cost.

We specialise in reducing valves, steam traps, & control valves for any duty.

BRITISH STEAM SPECIALTIES LTD.

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Preserves the fresh sea flavour of fish, and provides a lacquer film that will not fracture in the process of deep drawing.

The sulphur-resisting ZINNATINE. Prevents those blackening stains in vegetable packs.

Make sure that the product you place inside the tin "turns out" satisfactorily. That the full freshness, colour and flavour is preserved.
That the contents of every canned pack you send out enhance your trade name.
Trust Zinnatine Lacquers for this protection—ALL THE BEST PACKERS COME TO US FOR THEIR LACQUERS.
Full particulars gladly sent on request.

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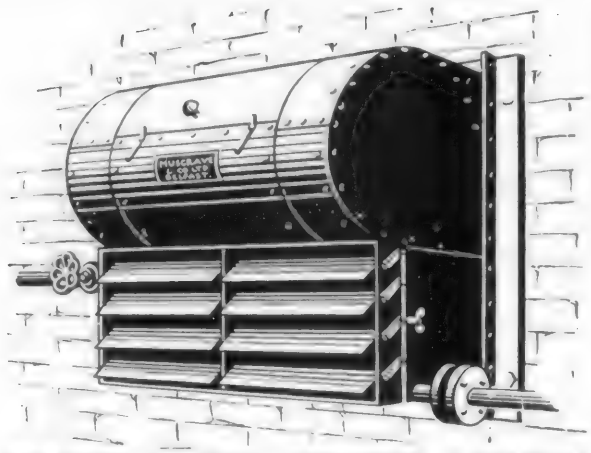

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page lxi

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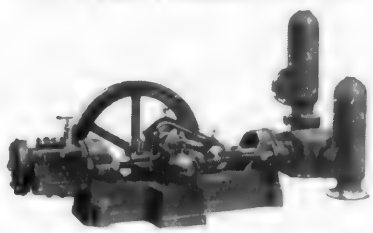

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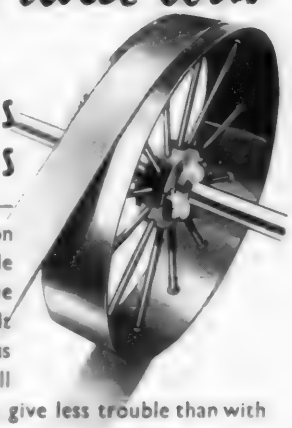
Save wear and tear on belts-

—WITH DOUGLAS LAWSON PULLEYS



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That this book has value for the Food Industrialist as well, may be gathered from the following excerpt from a "FOOD MANUFACTURE" review, dated March, 1937:

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This book has been written by an engineer who has considered the practical aims of an industry; and the wealth of information contained in it concerning machinery which is to be found in the food industry as well offers fresh scope for practical improvements in that and other allied industries. Manufacturer, operator and designer can all benefit by studying the book.

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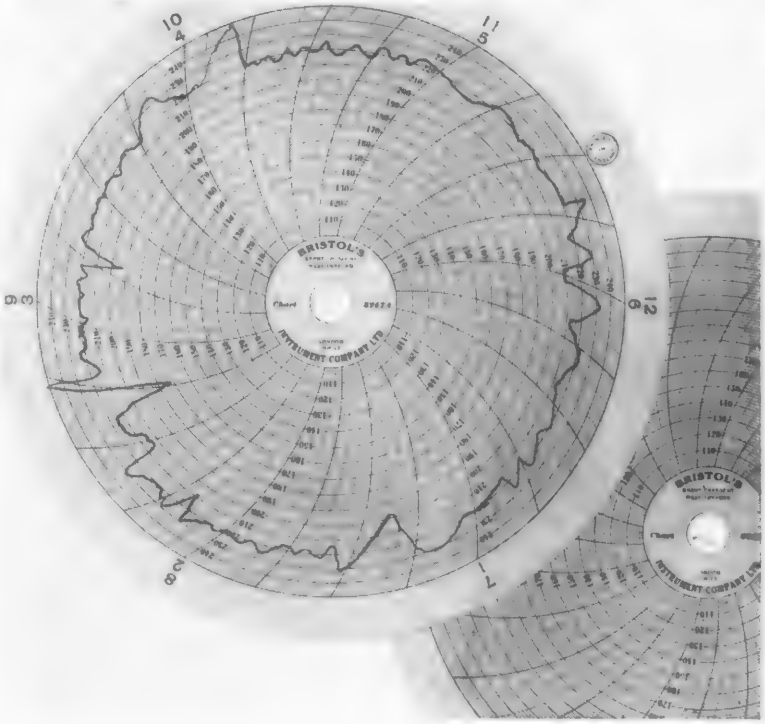
DO YOU KNOW *how temperatures fluctuate in your process?*



These charts tell you

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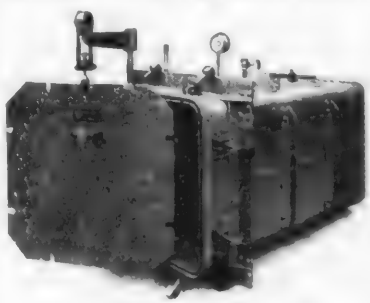

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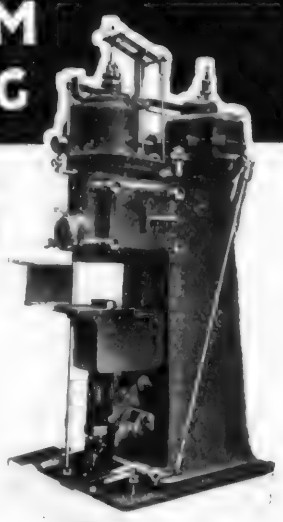

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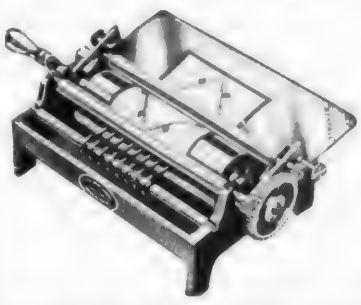

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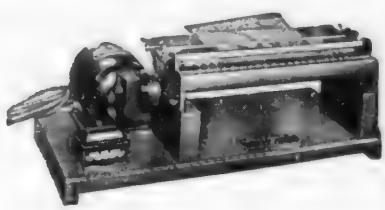

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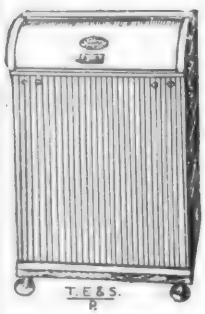

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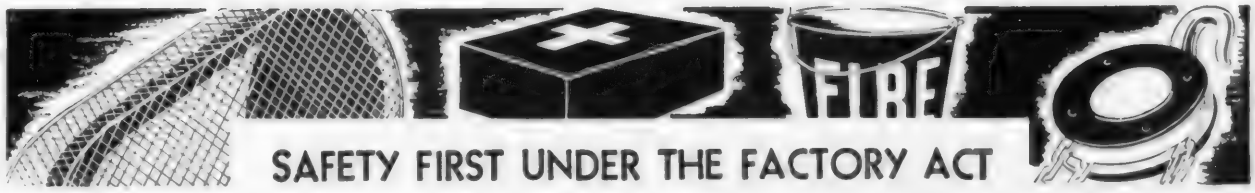

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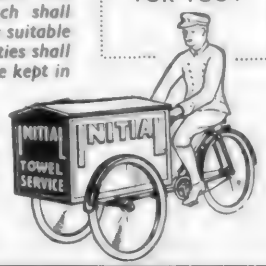

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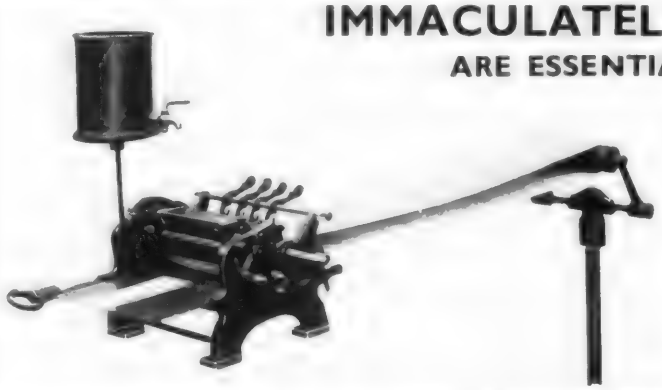

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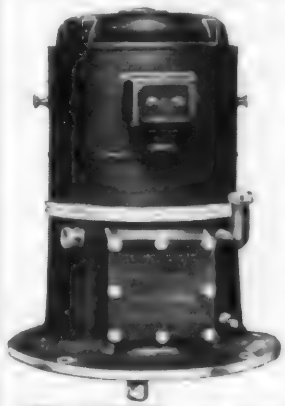

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SIMON Vertical Grinding Machine with 12 ins. Emery Compo Stones, also similar with 30 ins. Stones.—Box A967, *Food Manufacture*, 17, Stratford Place, London, W.1.

SOUTHALL & SMITH automatic weighing machine, ¼ to 2 lb. capacity, complete with motor, 220-230 volts, 50 cycles, 2-phase; in perfect working order; reasonable price.—Arthur Davy & Sons, Ltd., Paternoster Row, Sheffield.

WERNER Type Duplex Mixers of all sizes: 5, 4 and 3-roll Refiners; Grinding and Crushing Plant; Boiling Pans and Tanks; Hobart, Melvin and Read 3-speed Mixers; Vacuum and Drying Plant. Write for stock list.—Winkworth for Machinery, London Road, Staines. Tel.: 1010.

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THE proprietor of British patent No. 397482, dated November 20th, 1931, relating to Improvements in Refined Vegetable Product and Process of Making Same, is desirous of entering into arrangements by way of a licence or otherwise on reasonable terms for the purpose of exploiting the above patent and ensuring its practical working in Great Britain.—Inquiries to Mr. B. Singer, Chrysler Building, New York City, N.Y., U.S.A.

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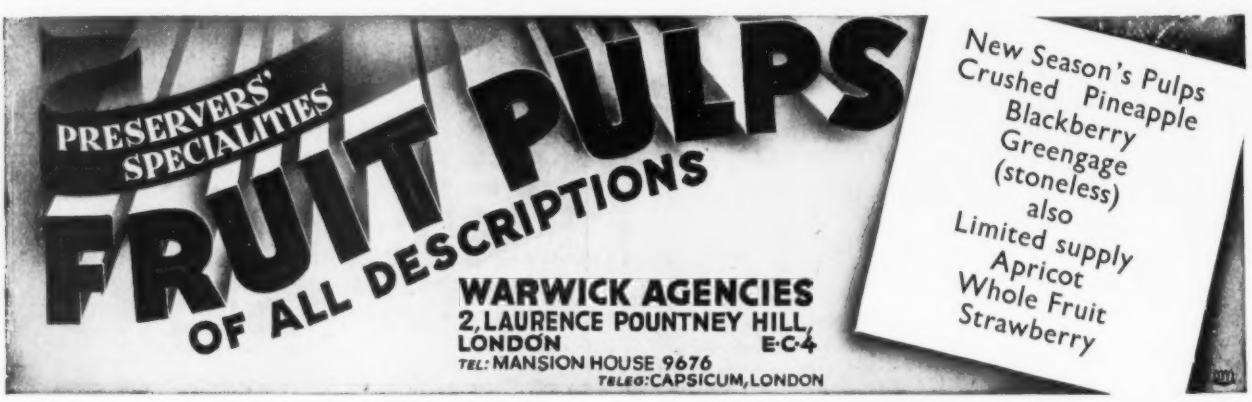

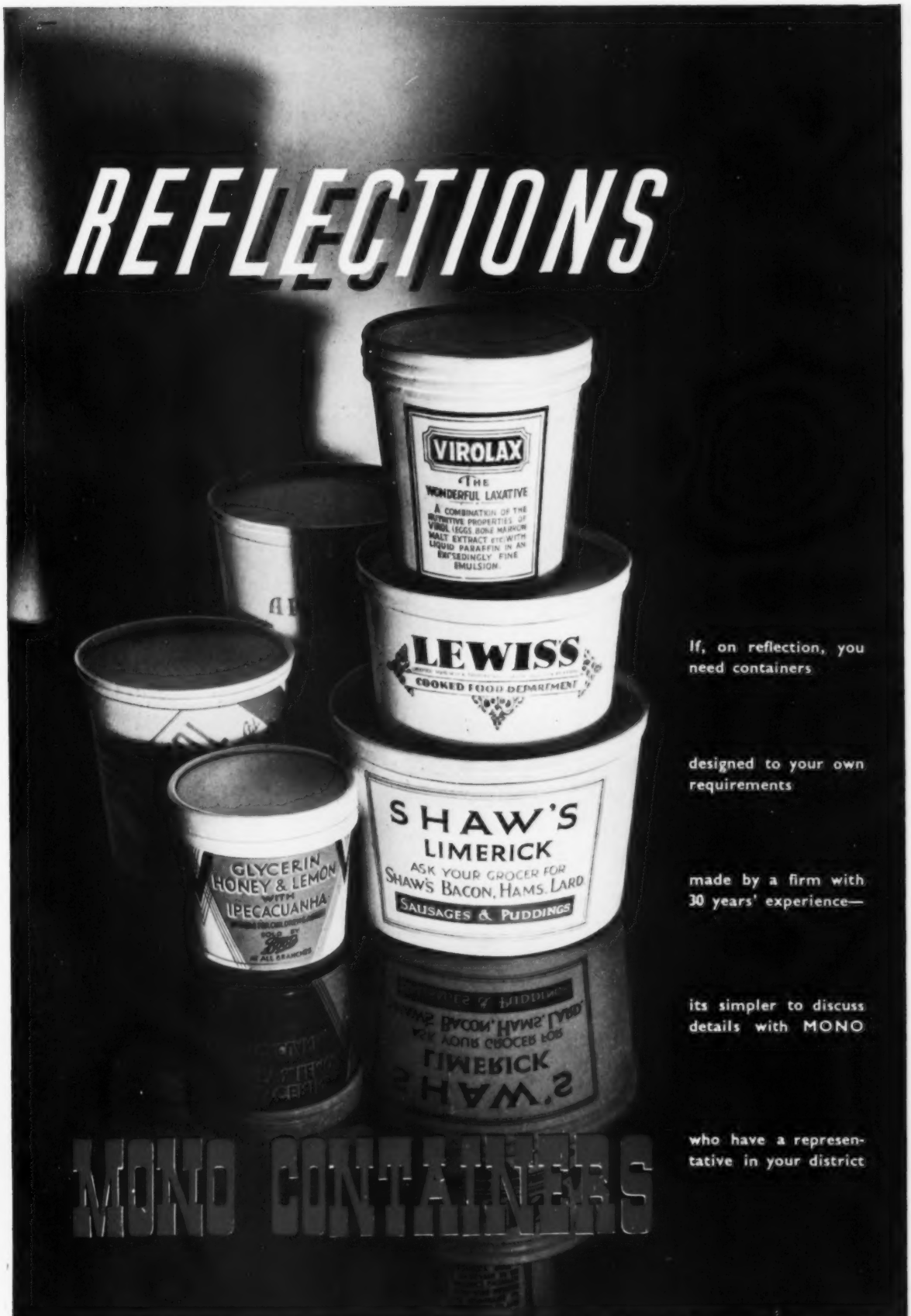

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